AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under Act of March 3, 1879.

Volume 87
Number Five
$1.00 a Year.

MARCH 1923

Published monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

"HARDEST, SMOOTHEST PORCELAIN IN THE WORLD"

ADAMANT

(Reg. U. S. Pat. Office)

PORCELAIN GUIDES
for
TEXTILE MACHINERY

The average manufacturer does not appreciate the enormous amount of damage that an imperfect guide can cause in the manufacture of textiles.

Mitchell-Bissell Co.

334 FOURTH AVENUE
NEW YORK

FACTORY, TRENTON, N. J.

Write for Catalogue

A NEW FEATURE OF FRANKLIN SERVICE

YOU DO NOT NEED TO BUY YOUR YARN and ship it to us to be dyed. Specify quantity, count and quality of yarn and colors desired. We furnish the yarn and do the dyeing. This saves you much bookkeeping and substantially reduces transportation costs. FRANKLIN DYED YARN is delivered to the weaving or knitting department on parallel tubes, cones or jackspools.

FRANKLIN PACKAGE DYEING is successfully handling wool, cotton, spun silk and worsted yarns, producing colors exceptionally brilliant and well penetrated, colors that are proving an important factor in the better marketing of many fabrics.

FRANKLIN PACKAGE DYEING, with its marked saving in dye-house floor space, fuel, steam, dyes and chemicals, is an economical service.

We also sell FRANKLIN DYEING MACHINES. If you desire to establish your own dye-house or raise the efficiency of your present dye-house, send for a Franklin man to consult with you.

FRANKLIN PROCESS CO.

Philadelphia PROVIDENCE Manchester, Eng.
New York Office, 72 Leonard Street
SOUTHERN FRANKLIN PROCESS CO.
Greenville, S. C.

A NORTHROP AUTOMATIC LOOM FOR NEARLY ALL ONE-SHUTTLE WEAVES

The Benefits that follow the installation of Northrop Looms—Lower Weaving Costs, Increased Production, Overtime Running Without Help, etc.,—are not confined to a few weaves. There is a Northrop Loom for almost every One-Shuttle Weave. The exceptions are few—and their day is coming.

Some of the goods now being made on Northrop Looms are:

Albatross Cloth
Army Duck
Artificial Leather Goods
Asbestos
Awnings
Bags and Bagging
Bandage
Batiste
Beach Cloth
Bed Spreads
Buckram
Bunny Cloth
Cambric
Chambrays
Cheese Cloth
Collar Goods
Colored Goods
Corduroys
Cotton Flannel
Cotton Worsteds
Coutils
Crash
Crepes
Crinkle Cloth
Crochet Quilts
Damask
Denims
Diaper Cloth
Dimities
Dobby Weaves
Domets
Double Cloth
Dress Goods
Drills
Duck
Endless Belt Tubing
Flannelette
Fustians
Ginghams
Handkerchief Cloth
Holland Shades
Huck Towel
Jute Canvas
Jute Upholstery Fabrics
Khaki
Fine Lawns
Leno Fabrics
Linen Canvas Padding
Lining Cloth (Alpaca)
Long Cloth
Marquisettes
Men's Wear
Millinery Goods
Minnow Netting
Mohairs
Mole Skins
Mosquito Netting
Muslins
Napkins
Napped Fabrics
Osnaburgs
Oxford Shirtings
Pajama Checks
Palm Beach Cloth
Percales
Pillow Tubing
Plisse Cloth
Plush
Poplin
Print Cloths
Reps
Serges
Scrim
Sheetings Narrow and Broad
Shelter Tent Duck
Shirtings
Table Felting
Tapestry
Terry Cloth
Terry Towels
Ticking
Tire Fabrics
Tobacco Cloth
Toweling
Tricotines
Umbrella Cloth
Union Crash
Upholstery
Velveteens
Venetians
Warp and Filling Sateens
Woolens
Worsteds

LET'S TALK IT OVER

If you contemplate starting a new weave or making any change in your product, call for our Salesmen and Experts. They are trained to serve you. There is no consultation charge. The service is yours for the asking.

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

SOUTHERN OFFICE ATLANTA GEORGIA

Copyright 1917 by Draper Corporation

Proctor DRYERS

SMITH & FURBUSH MACHINE CO. S&F PHILADELPHIA

"Smith-Furbush" Textile Machinery and "Proctor" Drying Machinery are now produced under same roof—

The Smith & Furbush Machine Company, Philadelphia, has been consolidated with Practor & Schwartz, Inc., of the same city. The combined organizations have taken the latter name.

Both companies have long been recognized as leaders in their line—the one, builders of Carding, Preparatory, Garnett, Felting, Shoddy and Waste Machinery since 1812; the other, builders of Drying Machinery since 1883.

The merging of these two old organizations means the welding together of vast individual experience and facilities, equipping them for better service than ever before.

The plant of the new organization, recently enlarged to 223,000 square feet of floor space, represents the last word in modern factory construction, equipment and operation.

PROCTOR & SCHWARTZ, INC.

Formerly

THE PHILADELPHIA TEXTILE MACHINERY COMPANY

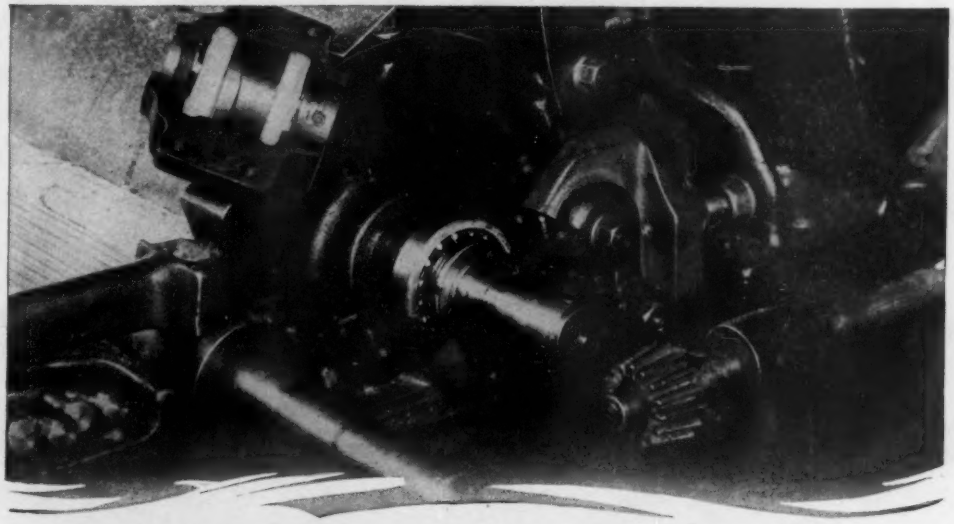
SMITH & FURBUSH MACHINE COMPANY

PHILADELPHIA, PA.

Five Acres of Daylight Factory Floor Space

Seventh Street and Tabor Road, Philadelphia, Pa.

SKF



Ball-Bearings on Licker-ins

Maintain Settings in Actual Operation

DELICATE licker-in adjustments lose all their value if the licker-in is out of true in running or if its bearings become slightly worn in service.

The wear in the bearings and tugging of the teeth in the lap causes the licker-in to vibrate and the teeth to strike the feed plate, producing an abnormal amount of short fibres and consequently a weak yarn.

But when the licker-in is mounted on SKF marked self-aligning ball bearings it can be set accurately and will maintain this accuracy in operation as this type of bearing develops no appreciable wear and automatically compensates for misalignment.

So great are the advantages of ball bearings on the licker-in and main cylinder that many firms have found it a good paying investment to change over their old plain-bearing equipment.

THE SKAYEF BALL BEARING COMPANY

Supervised by SKF INDUSTRIES, INC., 165 Broadway, New York City

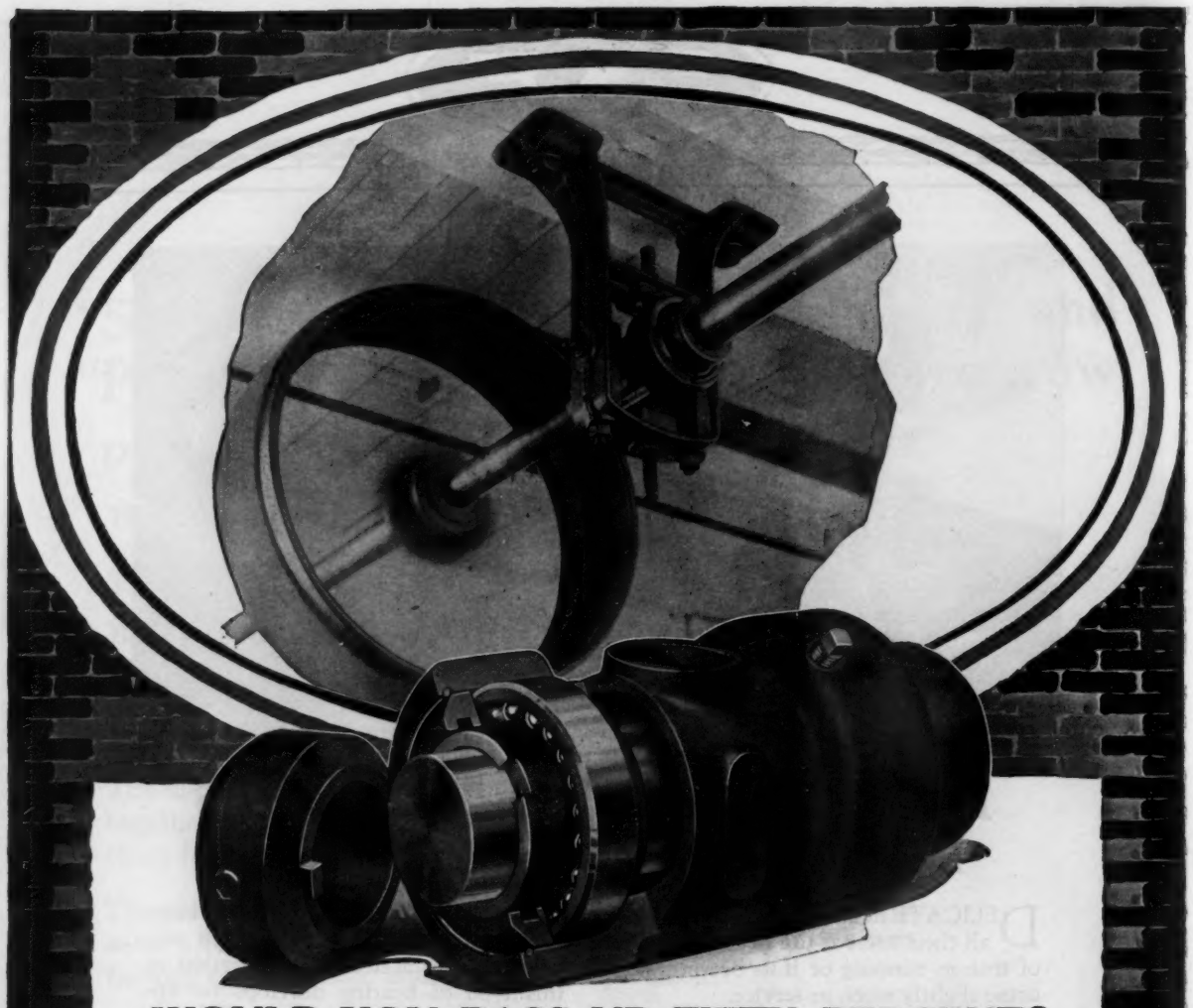
901

Normal View

Deflected View

BALL BEARINGS

The Highest Expression of the Bearing Principle



WOULD YOU PASS UP FIFTY PERCENT?

If you knew of an investment guaranteed to yield a fifty per cent annual reducon the money which you put into it, would you pass it up? Such opportunities are very rare, but we have one to offer everyone who transmits power by line shafting.

We guarantee **Fafnir Double Ball Bearing Hanger Boxes** to save fifty per cent of their cost in one year. As the result of tests made in many factories where **Fafnir Boxes** are installed, we have found that this guarantee is conservative. In many cases, **Fafnir** installations have paid for themselves within a year.

When building a new plant, erecting new lines of shafting or replacing old lines, it is an absolute waste not to install **Fafnir Boxes** in the hangers. Moreover, as **Fafnir Double Ball Bearing Hanger Boxes** fit all standard hanger frames, it is both easy and profitable to change over old equipment without disturbing your present frames.

THE FAFNIR BEARING COMPANY

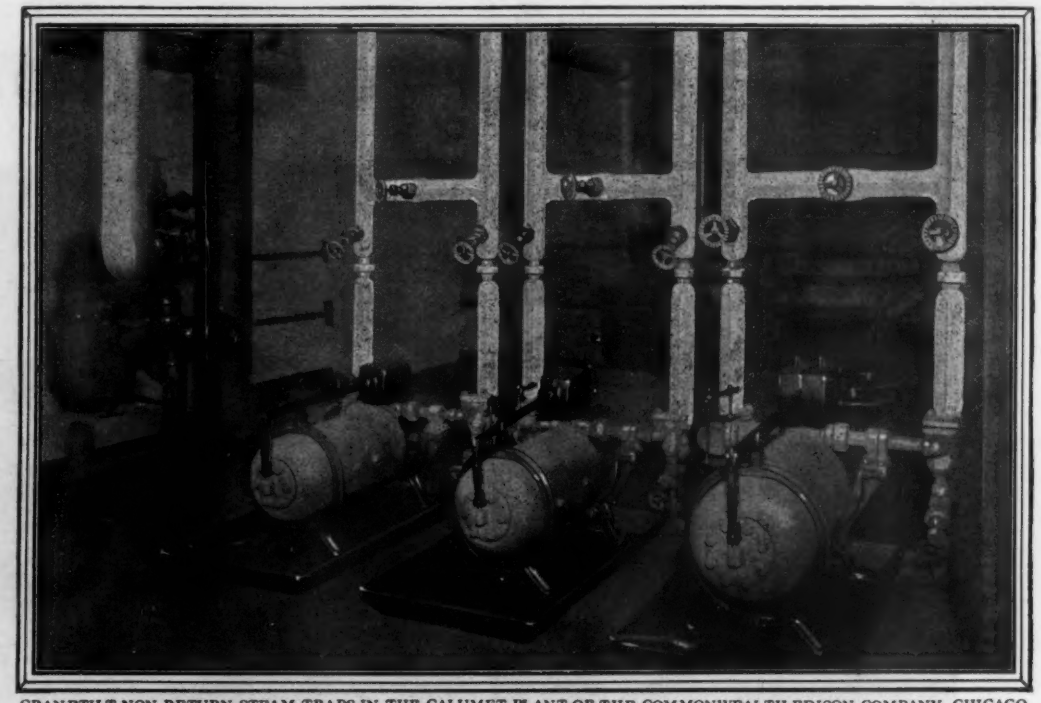
(Conrad Patent Licensee)

New Britain, Conn.

Southern Representatives

S. M. Smith, P. O. Box 1423, Greensboro, N. C. **O. R. S. Pool, Box 1375, Greenville, S. C.**

FAFNIR



CRANETILT NON-RETURN STEAM TRAPS IN THE CALUMET PLANT OF THE COMMONWEALTH-EDISON COMPANY, CHICAGO

CRANETILT STEAM TRAPS SAVE COAL

Boiler room economy largely depends upon efficient feed-water heating. Cranetilt Direct-Return Traps accomplish this economy by returning water to the boiler at a higher temperature than any other device. Cranetilt Non-Return Traps will handle ten times more water than bucket, pot or float traps with equal pipe-size connections. Cranetilt Three-Valve Lifting Traps are especially adapted for use on return lines handling condensation where the pressure will vary from a vacuum to the highest working pressure.

CRANE

GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVE., CHICAGO

Branches and Sales Offices in One Hundred and Thirty-five Cities
National Exhibit Rooms: Chicago, New York, Atlantic City
Works: Chicago and Bridgeport

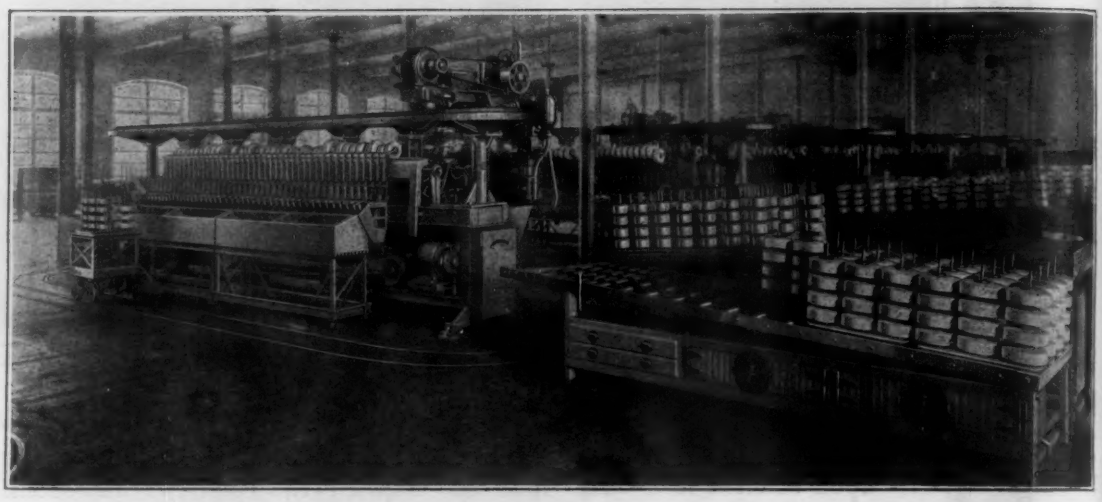
CRANE, LIMITED, MONTREAL. CRANE-BENNETT, LTD., LONDON
CRANE EXPORT CORPORATION: NEW YORK, SAN FRANCISCO
CIE CRANE, PARIS

Crane "Telsa" Wash Sink Faucet

AUTOMATIC SPOOLER

WITH

WEAVERS KNOTTER



EVERY mill man knows the advantages of the weavers knot over the round knot so commonly used in spooling.

It is sufficient to say that we can now supply our automatic spoolers equipped with Weavers Knotters.

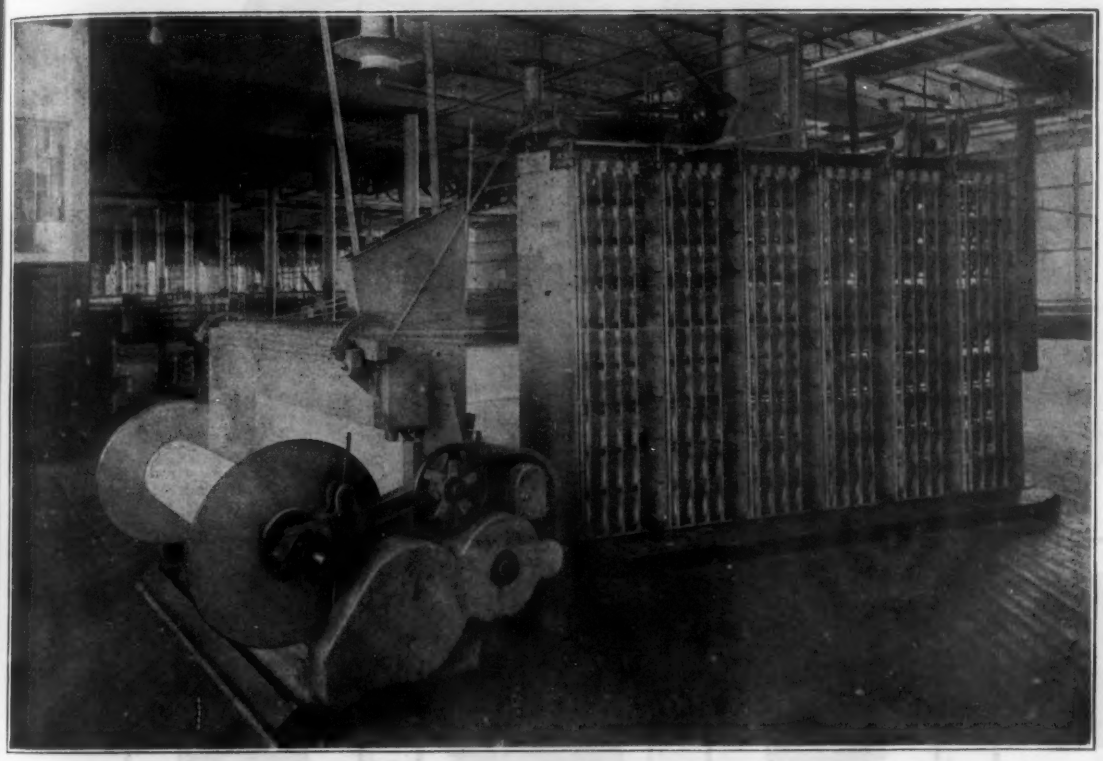
On the following page we enumerate some of the benefits resulting from the use of the Barber-Colman Spooling and Warping Process.

Barber-Colman Company

Rockford, Illinois

Boston, Mass. Greenville, S. C.

HIGH SPEED WARPER



SAVES half the employees in the spooling and warping department.
Saves more than half the floor space.

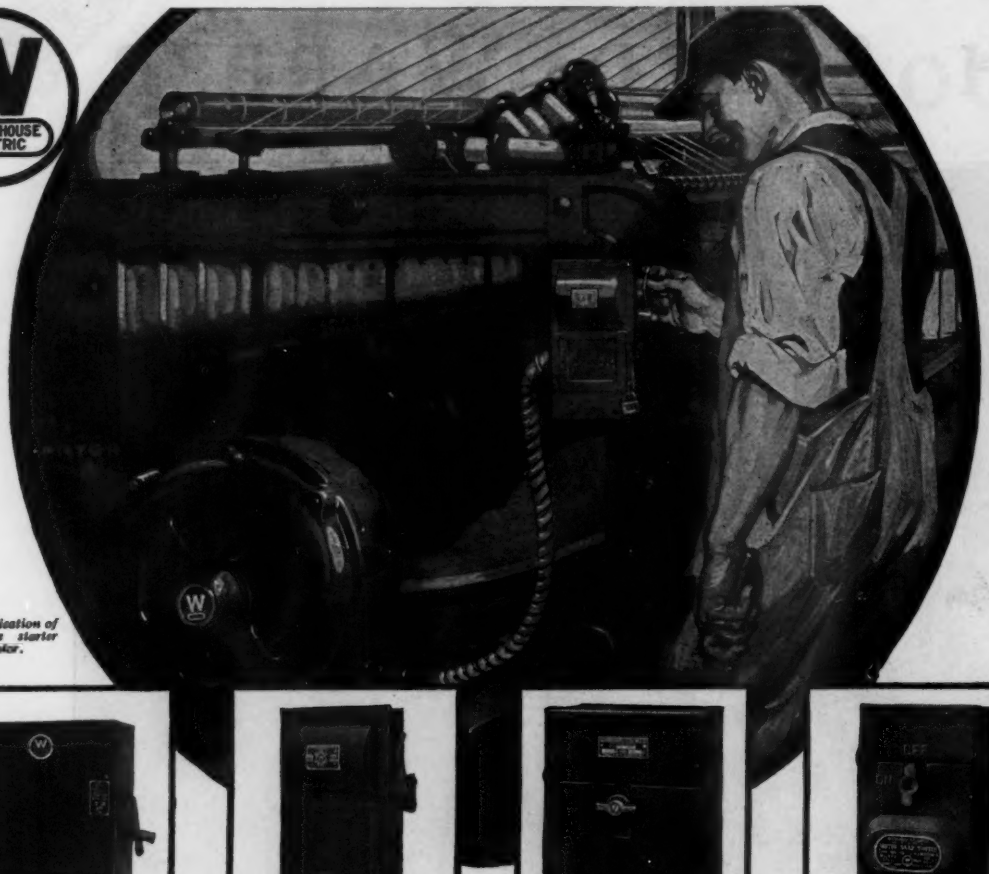
Saves three-quarters of the yarn in process in the spooling and warping department—(reduces inventory).
Weavers knots.
No spooler kinks.
Fewer ends broken in warping—Better slashing.
Yarn protected from damage and dirt because of method of handling.
All of which result in better weaving and increased loom production.

Barber-Colman Company

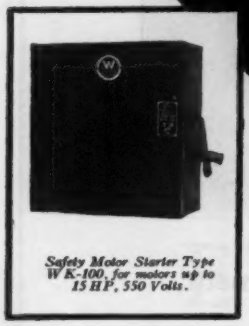
Rockford, Illinois

Boston, Mass. Greenville, S. C.

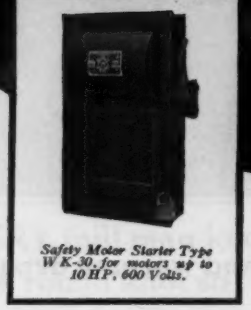
PROTECT YOUR MOTORS



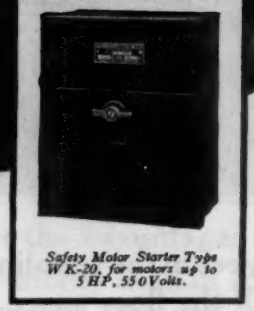
Textile Application of Westinghouse starter and motor.



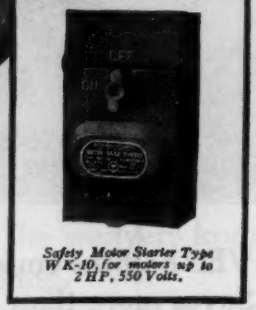
Safety Motor Starter Type W K-100, for motors up to 15 HP, 550 Volts.



Safety Motor Starter Type W K-30, for motors up to 10 HP, 600 Volts.



Safety Motor Starter Type W K-20, for motors up to 5 HP, 550 Volts.



Safety Motor Starter Type W K-10, for motors up to 2 HP, 550 Volts.

There is just as much real necessity for a good starting device on small motors as there is on large ones, and of course the slowness of recognition of this fundamental has been due in part to the lack of starting devices especially designed for the needs of the smaller motors.

The point is, first, *that the need for starting devices on small motors is far greater than the recognition of the need,* and, second, that Westinghouse has devised starters that will meet the special needs of motors of lesser capacities.

See what these starters offer:

Complete protection to the operator.

Full protection against *harmful* overloads to motor either in starting or running. Some of them also have under-voltage release.

Quick-make and quick-break, unvaryingly.

Utter simplicity of operation.

Current-carrying parts accessible only when no current is passing through them. Full protection against both accident and ignorance. These starters are low in cost, high in quality, reliability and durability. Wisdom and foresight approve their use.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
Safety Switch Section: Mansfield, Ohio

Westinghouse

© 1922 W. E. & M. Co.

In addition to—

—Increased production and
—Improved quality
—Less spoilage
—Better lighting and working conditions,
—Westinghouse Individual Motor Drive—

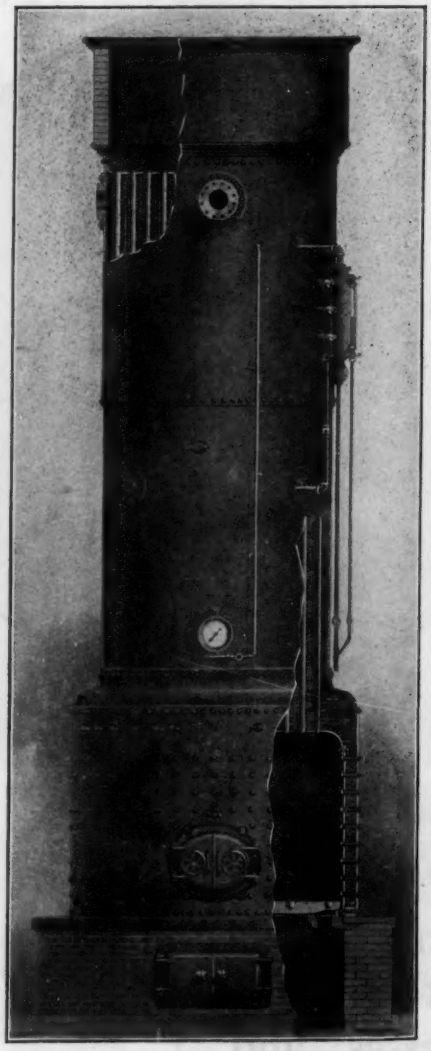
—Permits machines to be best arranged for the carrying out of the textile processes, and

—The economical operation of any machine or group of machines required either for overtime work or to take care of the regular daily output.

These are the principal reasons why both new and old mills are installing Westinghouse Individual Motor Drive.
Write our nearest district office for full information.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.
Sales Offices in All Principal American Cities

Westinghouse



Manning Type Vertical Boiler
Adapted for Mill Work

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

Southern Representative,
Isaac Hardeman, Charlotte, N. C.

BOSTON
PHILADELPHIA

NEW YORK
SAN FRANCISCO

Maintenance cost is low—

LUNKENHEIMER REGRINDING VALVES

The slogan of every industry, and one that is being carefully practiced is

ECONOMY

In any engineering appliance, economy is dependent upon the two factors

DURABILITY and SERVICEABILITY

and these are obtainable only by designs of ample proportions with a goodly margin of safety, the use of materials particularly adapted for the service intended, and exacting workmanship.

Lunkenheimer Regrinding Valves embody all the essentials that make for economy. Length of service is further prolonged by the regrindability of the seating surfaces and renewability of work or broken parts.

They are procurable in Globe, Angle and Cross Patterns of the Inside Screw or Outside Screw and Yoke types, Horizontal, Angle, Vertical and Swing Checks, Medium and Extra Heavy, for pressures up to 200 and 300 pounds respectively.

A copy of catalog 58-AK will be sent upon request.

3-27-10

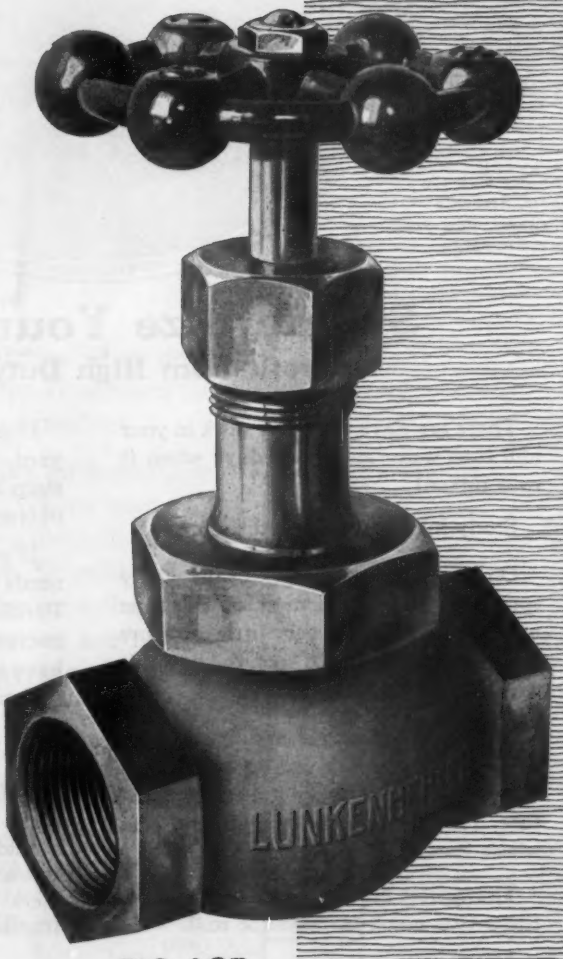


FIG 407

"America's Best since 1862"

THE LUNKENHEIMER CO.

"QUALITY"

LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD

NEW YORK CHICAGO CINCINNATI, U.S.A. BOSTON LONDON

EXPORT DEPT. 129-135 LAFAYETTE ST., NEW YORK

LANETT COTTON MILLS
West Point Mfg. Co.
Lanett, Alabama
Geo. H. Lanier, Vice Pres. and Gen. Mgr.

Drills, Sateens and Sheetings
83,500 Ring Spindles
2,408 Looms

Standardize Your Weather

Profit from High Duty Climate

There are days when the work in your mill runs well—and other days when it runs rotten!

Study into your air conditioning.

On frosty fall mornings—or on windy spring mornings and most of the time in between—there is very little moisture in the air. (It was 26% on the day this was written.)

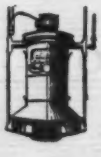
Take this outside air and warm it to 75 or 80 degrees—as you do in a cotton mill—and it positively itches for moisture. It proceeds to get what it can, where it can, as easily as it can.

The easiest place it can get it is from the cotton going through the mill.

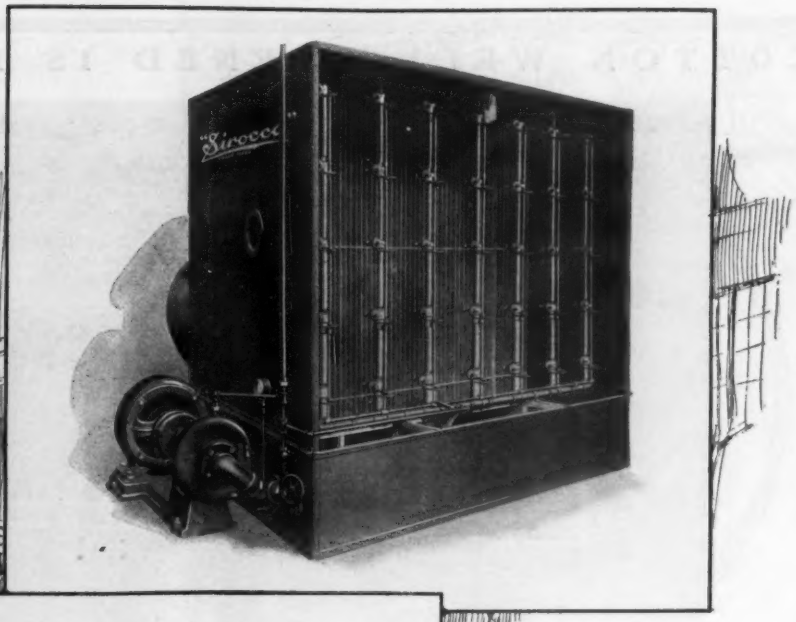
Hence—dry cotton, loose ends, fly yarn, loss of weight in goods, loss of sleep in managers, and loss of temper in overseers and help.

If you see such symptoms, your mill needs a study of its air conditioning. ParkSpray climate means we provide everything but sunshine—that you'll have to provide yourself. It is not so difficult when the work runs well!

At the West Point Mfg. Company's plant there are 2408 automatic looms in a single saw tooth weave shed. Saw tooth weave sheds are not so easy to humidify as rooms in multi-story plants. But with ParkSpray High Duty Humidifiers and regulators, this mill has standardized climate.



Parks-Cramer Company
Engineers & Contractors
Industrial Piping and Air Conditioning
Fitchburg Boston Charlotte



Ideal Air Conditions

Fabrics are like human beings—they serve best when properly treated.

Modern science has demonstrated that definite temperature and humidity conditions of the atmosphere insure a better product.

American Blower products play an important part in the textile industry. Where material is to handled or dust to be collected; where large volumes of hot air are to be exhausted; where drying is required; where cooling, humidifying, heating and ventilating are necessary, there are types of American Blower Equipment to solve each particular problem.

Our engineers are at your service to assist in selecting and applying this equipment to your special conditions.

AMERICAN BLOWER COMPANY, DETROIT
BRANCH OFFICES IN ALL PRINCIPAL CITIES
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONT.
(234)

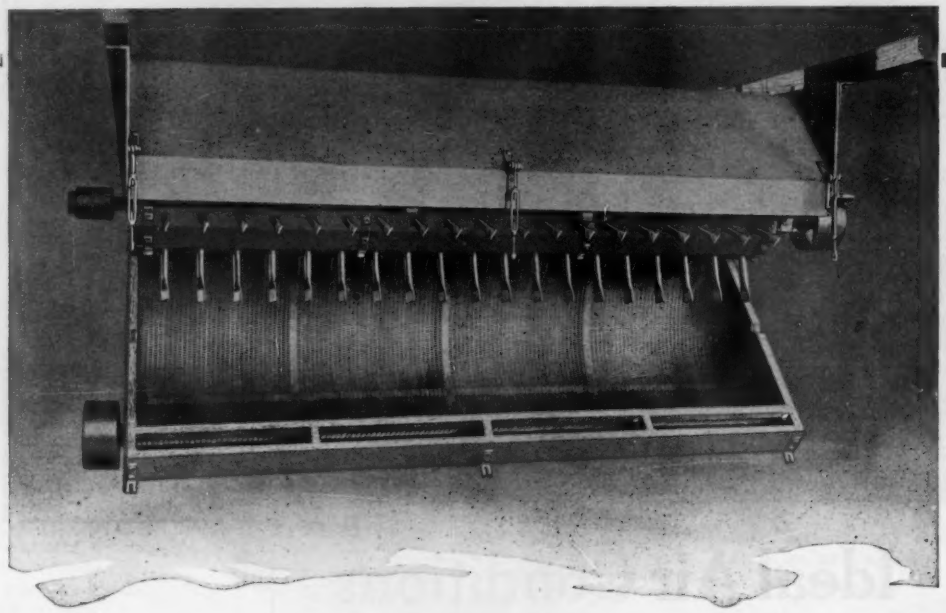
American Blower Air Washer used in various textile mills

American Blower

"Sirocco" TRADE MARK

EXHAUSTERS · VENTILATING FANS · AIR WASHERS · BLOWERS · ENGINES
FOR HEATING, VENTILATING, DRYING, AIR CONDITIONING, MECHANICAL DRAFT

COTTON WELL OPENED IS HALF SPUN



A Few of the Representative Mills

WHO HAVE ORDERED THE
Murray Cotton Cleaning and Aerating Machine

Sharp Mfg. Co., New Bedford, Mass.
Johnson & Johnson, New Brunswick, N. J.
American Textile Co., Atco, Ga.
Mandeville Mills, Carrollton, Ga.
Maginnis Cotton Mills, New Orleans, La.
Swift Mfg. Co., Columbus, Ga.
Hamilton Mfg. Co., Lowell, Mass.
Highland Park Mfg. Co., Charlotte, N. C.

The Murray Cotton Cleaning and Aerating Machine thoroughly cleans and aerates the cotton without injuring the fibre. It can be set into the cotton suction pipe between opening room and breaker pickers and hung from the ceiling or other convenient support. No expensive connecting arrangements necessary.

Opening machinery can be speeded up or slowed down to meet requirements of breaker pickers without altering speed of the cleaner. The Murray takes care of itself. It has a working capacity of 25,000 lbs. of cotton in a ten-hour day—more than any other cleaning machine on the market.

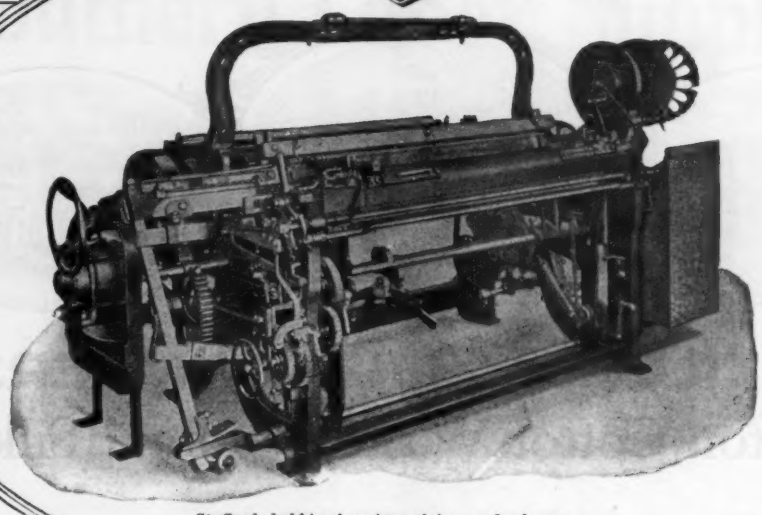
Cylinder runs in ball bearings. Every bearing on the Murray is in plain sight.

Ask for full information today.

THE MURRAY COMPANY
ATLANTA, GA.

The Murray (PAT. PENDING)
COTTON CLEANING AND AERATING MACHINE

COTTON WELL OPENED IS HALF SPUN



Stafford bobbin-changing plain goods loom.

Simplicity Insures Dependable Production

Simplicity is the secret of the success of any piece of machinery. Stafford looms were simplified by using less parts to do the same work, and arranging these parts so that the fixer can easily and quickly get at them. Take the stop motion, for instance. This is placed on the side of the loom, very rarely getting out of adjustment but easy to get to. This stop motion will not chew up the drop wires as the bar that engages the wire has a rolling motion, and there is no chance whatever to damage the wires on the end. It puts less strain on the warp yarn.

The Stafford line of automatic looms is complete, both bobbin and shuttle-changing for weaving every type of fabric that can be made with a single shuttle—a Stafford Loom for every kind of yarn, coarse and fine and for practically every variety of fabric, plain or fancy.

THE STAFFORD COMPANY

WEAVING MACHINERY

READVILLE, MASS.

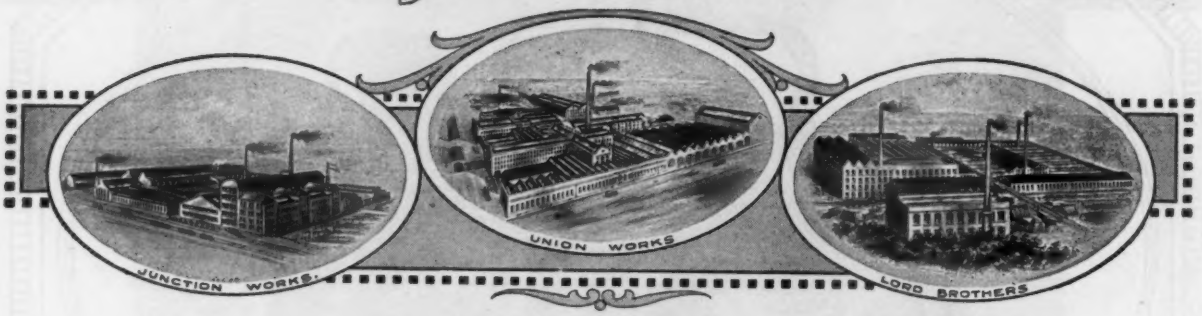
Branch Office	*Southern Agent*	*Canadian Representative*
502 Colt Building	J. H. Mayes	Whitehead, Emmans, Limited
Paterson, N. J.	Charlotte, N. C.	Montreal

AUTOMATIC

STAFFORD

LOOMS

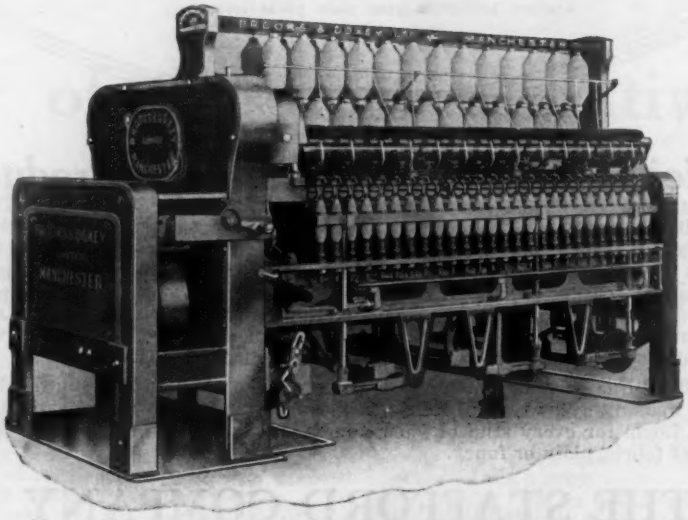
BROOKS & DOXEY
(1920) LIMITED



TEXTILE MACHINERY MAKERS
For the Cotton, Cotton Waste, Wool and Silk Trades

Mixing, Opening, Carding, Preparing, Spinning, Winding, and Doubling Machinery for Cotton; Machinery for Waste Opening, Carding and Spinning on Various Systems; self-acting Mules and Cheese Winders for Wool. Polishing Machines for Sewing Thread;

Cables:
"UNION
Manchester,
Eng."



RING SPINNING FRAME FOR TWIST

Frame ends and spring-pieces made with loose feet to adjust to uneven flooring. Rollers carried on strong angle beams supported by spring-pieces; framing stiffened by specially-constructed girder rails which carry spindles, ring rails and lifting motion. The whole frame is rigidly braced together to ensure freedom from vibration when spinning at high speeds.

Patent Conditioning Machine for Yarn on Ring Bobbins; Patent Splicing Machine for the "Knotless" Yarn Trade; Roving Waste Openers; Thread Extractors; and Spinning and Doubling Frames for Silk. Also of Tin Rollers, Fluted and Plain Rollers, Spinning and Doubling Spindles, Rings, etc.

Codes:
A.B.C. 5th,
Lieber's, A.1,
Bentley's,
and
Western Union
(Universal)

HEAD OFFICE:- UNION IRON WORKS, WEST GORTON, MANCHESTER, ENG.

INCORPORATING LORD BROS. TODMORDEN.

Southern Labor Supply Attracts Mills to South

REASONS for the movement of textile mills from the north to the south are cited by the New York Herald in an editorial contained in a January issue. Quoting figures to show that the four-year period embracing 1917 to 1922 the north gained 400,000 spindles while the south was gaining 1,336,000 spindles; the Herald gives the following major reasons for the trend southward:

"The forces that are pulling this industry away from its northern moorings and putting it in closer contact with the sources of raw material are natural causes. With the south's water power unsurpassed anywhere in the north the logical place for the cotton mills is in the cotton field. Hydro-electric development brings this power to regions remote from the source. The wonder is not that there has been a great increase in southern textile manufacture, but that the increase has not been greater.

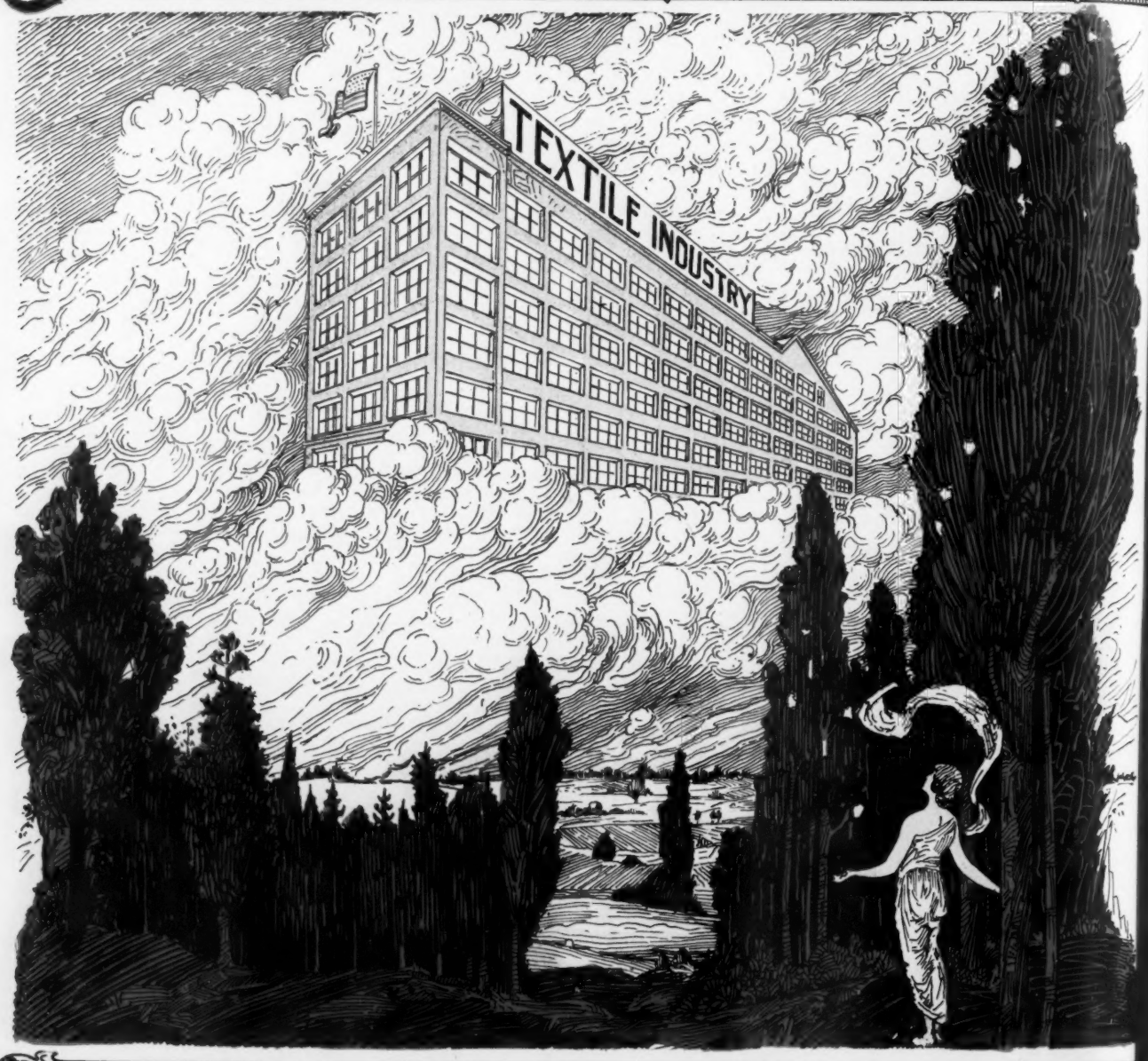
"Another advantage possessed by the south is the abundance and quality of its labor supply. Its mill forces are almost exclusively recruited from the great reservoir of pure Americans that for generations has been largely stagnant in the southern mountains. Labor of this character means freedom from entanglements which the promotion of radicalism has made a handicap to northern manufacturers. Even if the south's advantages in this respect should not continue, the fundamental advantages of proximity to growing cotton and of milder climatic conditions will remain."

Alabama offers more than any other state for textile mills—raw cotton, almost at the mill door; abundant hydro-electric power with ample steam reserve; free factory sites in many communities; efficient native labor; cheaper transportation by water and rail routes. Full information furnished to all interested on application.

ALABAMA POWER CO.

BIRMINGHAM ..... ALABAMA

Tennessee-The Hea



The Tennessee El

art of Industrial America

Where Land and Building Costs are Lower

Tennessee wants textile mills and offers to prospective manufacturers not only lower manufacturing costs and better industrial conditions, but also the additional advantages of desirable land and requisite building materials at lower costs.

Ideal mill sites are available in scores of localities, either in or adjacent to progressive cities and towns or where mills desiring to do so can develop self-contained communities and mill villages. Land is convenient to both railroads and water routes and in general these localities can be procured for less than corresponding lands in other parts of the country.

Building materials are abundant in the state. Tennessee produces annually nearly 80,000,000 board feet of lumber of all varieties together with large quantities of brick, granite, slate, cement, and limestone, and her industries are well known throughout the world for the manufacture of boilers, castings, sewer pipe, alloys, and building and erection machinery of various kinds.

Construction material costs are lower than in other sections owing to the nearness to the sources of production and the consequent saving in freight rates. Lower living costs insure labor for construction purposes cheaper than elsewhere.

All of this means that not only are manufacturing conditions ideal for economic production, but the cost of building and equipping a mill is less in Tennessee.

FIVE ADVANTAGES IN TENNESSEE

1. Ideal climate the entire year.
2. Raw materials of all kinds in abundance.
3. Market facilities — unsurpassed rail and water transportation.
4. Ample supply of intelligent and stable labor.
5. Continuous and reliable electric power at low cost.

Write us today for further information regarding available industrial sites.

THE TENNESSEE ELECTRIC POWER COMPANY
CHATTANOOGA, TENNESSEE

lectric Power Co-

THE FUN FUL LINE

PLAYGROUND EQUIPMENT

Superior Apparatus
Used by over 300 Cotton Mills!

Used on the recreation grounds of more industrial plants than all other makes combined.

Over 20 years devoted to the manufacture of childrens outdoor health building goods exclusively.

Catalog on request.

HILL-STANDARD CO.

Anderson, Indiana

Keep Production Up to Top Notch with this Handy Instrument

We make Indicating and Recording Liquid Level Gauges, Thermometers, Pressure Gauges, CO_2 Recorders, Temperature Controllers, etc., for use on Size Boxes, Dye Tubs, Bleaching Kiers, Slashers, Drying Machines, Kettles, Steaming Boxes, Drying Cans, Woolwashers; and for the Power Plant

A textile mill tachometer that is light, compact, easy to use, easy to read accurately, and permanently dependable is the handiest instrument a man can own.

The Foxboro Hand Tachometer possesses all these qualities. Range finding is automatic. There's no adjustments or changing of arbors, and no danger of damaging the instrument. The range you are using is clearly indicated. R.P.M. readings can be taken quickly and accurately because of the wide range of speeds, clear scale divisions and lack of vibration of the pointer.

The Foxboro Tachometer is useful for checking up speeds of spindles, front rolls, flyers, slubbers, intermediates, jack frames and any shaft, motor, or pulley in the mill. It helps keep production up to top notch.

Let us send you one on free trial. You will be quickly convinced of its value and convenience. Write today to Dept. AS.

THE FOXBORO CO., Inc.

FOXBORO, MASS., U. S. A.

New York Chicago Boston Cleveland Tulsa
Pittsburgh Philadelphia San Francisco Birmingham

Peacock Brothers, Limited, 170 Delorimier Avenue, Montreal, Canada

FOXBORO

TRADE MARK

THE COMPASS OF INDUSTRY

4809

Let Us Add Your Name To This List

OUR service to textile mills is the result of years of experience in installing textile theatre equipment. Our representatives call upon the mills personally, lay out the plans, advise on the proper equipment required and finally supervise the installation and the starting of the theatre. In other words, they take the whole problem off your hands and do not turn over the work to you until the theatre is operating satisfactorily.

The textile industry is demanding the best moving pictures for their employees and that is why they regularly specify POWER'S PROJECTORS.

That is why more Power's Projectors are used by textile mills in the South than all other projectors combined.

We carry a complete line of supply parts and equipment at our various branches. Your orders for supply parts will be filled the same day the order is received. Whatever are your needs for your theatre, we can supply them.

We have a special offer for Textile Mills. May we present it to you?

Satisfied Users of POWER'S PROJECTORS

ALABAMA

W. A. Handley Mfg. Co.	Roanoke
Tallassee Mills	Tallassee
Fairfax Mill	Fairfax
Avon Mills	Sylacauga
Lanett Cotton Mills	Lanett
Indian Head Mills	Cordova
Selma Mfg. Co.	Selma
Buck Creek Cotton Mills	Siluria

GEORGIA

Elm City Cotton Mills	LaGrange
Bibb Mfg. Co.	Porterdale
Roswell Mfg. Co.	Roswell
Gainesville Cotton Mill	Gainesville
Bibb Mfg. Co.	Columbus
Pacolet Mfg. Co.	New Holland
Manchester Cotton Mills	Manchester
Milstead Mfg. Co.	Milstead
Thomaston Cotton Mills	Thomaston
Exposition Cotton Mill	Atlanta
Habersham Mill	Habersham
Trion Company	Trion
Union Point Mfg. Co.	Union Point
Hillside Cotton Mill	LaGrange

NORTH CAROLINA

Durham Hosiery Mills	Durham
Pamona Mills	Greensboro
Cleveland Mill & Power Co.	Lawndale
Rodman-Heath Cotton Mills	Waxhaw
Rocky Mount Mills	Rocky Mount
Cherokee Falls Mfg. Co.	Cherokee Falls
Roxboro Cotton Mills	Roxboro
Consolidated Textile Corp.	Burlington
Carolina Cotton & Woolen Mills	Spray
Erwin Cotton Mills	Duke
Cannon Manufacturing Co.	Kannapolis

SOUTH CAROLINA

Baldwin Cotton Mills	Chester
Tucapau Mills	Tucapau
Ware Shoals Mfg. Co.	Ware Shoals
Glenn-Lowry Mfg. Co.	Whitmire
Monaghan Mills	Greenville
Drayton Mills	Spartanburg
Victor Mills	Greer
Conestee Mills	Conestee
Kershaw Cotton Mills	Kershaw
Abbeville Cotton Mills	Abbeville
Chesnee Mills	Chesnee
Union-Buffalo Mills	Buffalo
Victor-Monaghan Mills	Seneca
Victor-Monaghan Mills	Jonesville
Pacolet Mfg. Co.	Pacolet
Aragon Mills	Rockhill
Graniteville Mfg. Co.	Vaucluse
Woodside Cotton Mills	Greenville
Orr Cotton Mills	Anderson
Issaqueena Mills	Central
Clifton Mfg. Co.	Clifton
D. E. Converse Co.	Glendale
Winnsboro Mills	Winnsboro
Monarch Mills	Lockhart
Republic Cotton Mills	Great Falls

Southern Theatre Equipment Company

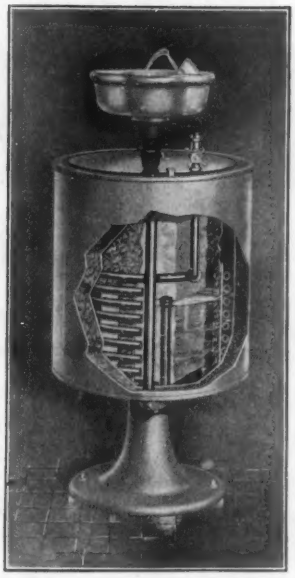
WILLIAM OLDKNOW, President.

No. Nine Nassau St.
ATLANTA, GEORGIA

THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

Eighteen Fifteen Main St.
DALLAS, TEXAS

Perfect Drinking Stream



Automatic Stream Control

No. 570-A

Does thirst-quenching cost you $18,000.00 per year ?

In a cotton mill of 1,000 men with an average wage of 30 cents per hour, two minutes per drink, six drinks per day, the cost of thirst-quenching is $60.00 per day or $18,000.00 per year.

And yet, that staggering figure represents but a fraction of the actual cost in the *average* cotton mill.

Working men in the South drink oftener than six times per day and average more than two minutes per drink, especially if each man must wait in vain at a faucet for the water to cool.

Halsey Taylor Instantaneous Cooler Fountains at frequent intervals throughout the mill not only cut thousands of dollars from this figure, but also improve the health of your men and increase their efficiency by providing cool refreshing water but a few steps away.

Halsey Taylor Fountains are more sanitary, more efficient and more satisfactory for three vital reasons:—

The Perfect Drinking Stream

Automatic Stream Control

The Guarded Water Outlet

As evidence of this, more than a score of the largest corporations in the country have 100 or more Halsey Taylor Cooler Fountains in use today, and they are constantly increasing their number of Halsey Taylor fixtures.

Write today for our new 32-page catalog of drinking fountains and fixtures for mills, factories, parks, playgrounds, school houses and all kinds of public buildings.

THE HALSEY W. TAYLOR COMPANY, WARREN, OHIO

BRANCH OFFICES

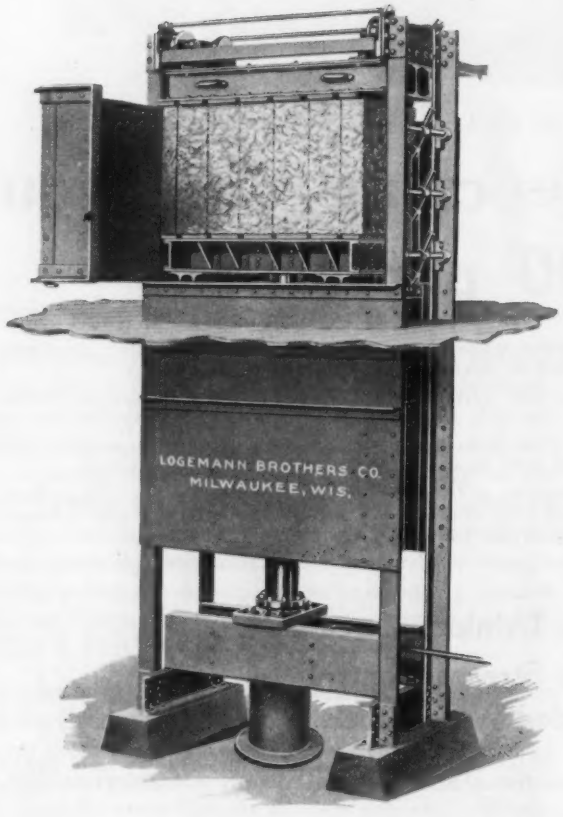
New York City 137 East 43rd St. | Philadelphia 5224 Greene St. | Boston 46 Cornhill—Rm. 512 | Chicago 1702 N. Talman Ave. | Kansas City 2618 East 33rd St. | San Francisco 237 Rialto Bldg.

HALSEY TAYLOR

LOGEMANN

Hand-Belt-Electric-Hydraulic

Baling —— Presses



There Are

LOGEMANN BALERS

For All Purposes

In our line of more than eighty types and capacities will be found a machine to suit every conceivable purpose and condition from powerful hand-operated presses for baling clippings, to deep-box hydraulic machines for fluffy waste of all kinds.

Progressive mill operators are today adopting the LOGEMANN press as standard (*First*) Because of the quality of the workmanship, design and material; (*Second*) because of the stability of the company building these machines, and our reputation for speedy service on the comparatively rare occasions when repairs are needed.

A letter setting forth your baling problems will be appreciated.

LOGEMANN BROTHERS CO.

Main Office & Works - Milwaukee, Wis.

To Build—Now or Later?

Will construction costs go up or down within the next few years? Is it better to build now and protect present markets, or wait for a decline in construction costs, which may or may not come, at the risk of losing current opportunities?

It is a question that can be answered only in the light of experience with similar questions in the past and with a thorough knowledge of conditions as they are today. It is this knowledge and experience which Lockwood, Greene & Co. offer their clients.

Lockwood - Greene service combines the judgment of managers and financial men of business training with the technical skill of engineers and architects, each a specialist in his line.

Lockwood-Greene counsel is based on a thorough study not only of the engineering problems involved, but of the market conditions and financial considerations with which your business is immediately concerned. It seeks to safeguard the present and to anticipate the needs of the future.

Send for our booklet "Building with Foresight." It may give you a new conception of engineering service and how it can be applied to your particular problem.

Building With Foresight

LOCKWOOD, GREENE & CO.

ENGINEERS

EXECUTIVE OFFICE, 24 Federal Street, Boston 9

Boston Atlanta Chicago New York
Detroit Cleveland Charlotte
Lockwood, Greene & Co. of Canada, Limited, Montreal
Compagnie Lockwood Greene, Paris, France

A 1200 ACRE TEXTILE CITY

THE development of 1200 acres of rolling land into a complete textile city for the Dixie Spinning Mills at Chattanooga presented quite an interesting problem. To solve the problems, Robert & Company, Inc., were engaged to handle the entire development of 160,000 spindles, consisting of four units of 40,000 spindles, each to manufacture one special number. Number 1 mill is shown under construction in the airplane view above.

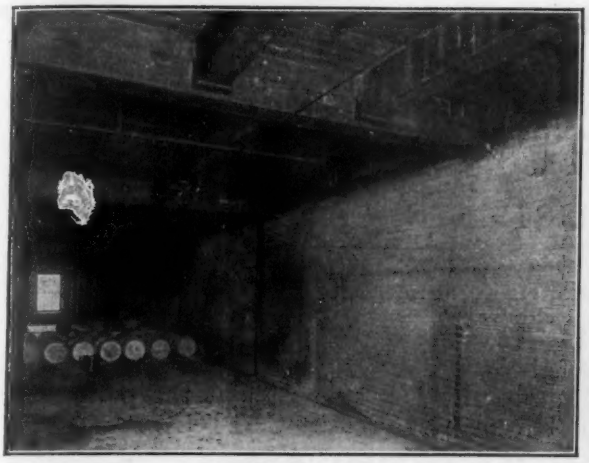
In carrying forward the work on this initial unit, every feature of ultimate development was carefully studied and all phases of the development worked out with a clear vision of future requirements so as to merge into a final development that would function harmoniously and operate profitably and economically. Various schemes were worked out before final plans were decided upon for village layouts, water and sewage systems, fire protection, street locations, design and placing of buildings, warehouses, opening room, waste house, boiler house, machine shop, etc.

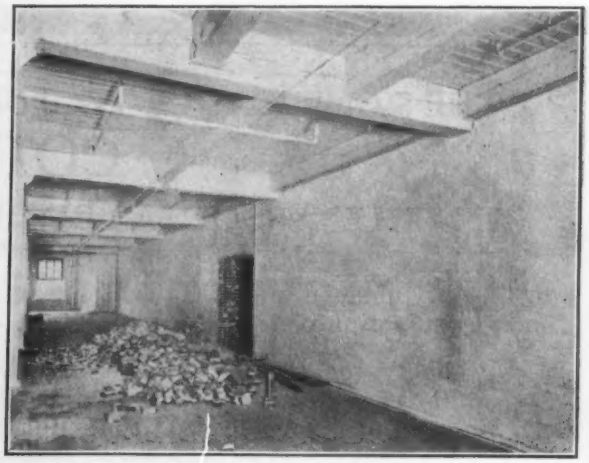
Architectural, engineering and power experts, each specializing in his particular field, assure our clients of not only the most efficient solution of any problem entrusted to us, but a real money-saving not only in initial investment but in permanent satisfaction and dividend-paying economy.

May we solve YOUR problems for you?

ROBERT & COMPANY

ARCHITECTS AND ENGINEERS INCORPORATED ATLANTA, GA.





These two views, taken from unretouched photographs, show the remarkable difference that Surlight will make in the average plant. Note especially how the dark corner in the rear has been brightened up by the use of Surlight.

The Whitest Paint Made!

Surlight is the whitest mill-white paint made. This is an actual fact that is open to demonstration—results will show that in every case, under similar conditions and service. Surlight is whiter when applied, whiter when dry and stays white longer than any paint or enamel you can buy.

Surlight has very high light-reflecting properties, completely free from glare or dazzle. It diffuses a soft, restful light—eye strain is lessened, and since workers can see better, naturally they do better and more work. Spoilage is reduced, production increased, and many accidents prevented.

Surlight makes workrooms more cheerful and pleasant—it sheds light in dark corners and discourages the practice of allowing rubbish to accumulate in places where otherwise it would not be seen.

Surlight is not a dust and dirt catcher—it dries with a hard, smooth surface that is non-porous and can be washed as frequently as desired. It withstands shocks and jars—does not powder, check or flake and will not fall off and spoil warp.

Surlight has great covering power and spreads easily when brushed on. It can be sprayed on if desired.

The next time you paint, invest in Surlight! Its first cost is reasonable and because it wears so long it makes frequent repainting unnecessary.

Send for our book on Surlight—we also manufacture a full line of paints for all purposes and will gladly send complete details on any phase of painting in which you may be interested.

ST. LOUIS SURFACER & PAINT CO.

4211 Arlington Ave., St. Louis, Mo.

SURLIGHT

The Light Reflecting Wall Paint for Industrial Purposes

THE SIGNIFICANCE TO *YOU* OF THE MEMBERSHIP OF COTTON IN THE ASSOCIATED BUSINESS PAPERS, INC.

YOU depend upon COTTON for an unbiased and accurate report of all news affecting your business interests.

Probably, too, you give heed to its editorial counsel in many matters of considerable consequence. You have a right, therefore, to know about the policies and principles back of the important service rendered by COTTON.

The membership of this publication in The Associated Business Papers, Inc., means that it has achieved an exceptionally high publishing standard, and has subscribed unreservedly to these—

STANDARDS OF PRACTICE

The publisher of a business paper should dedicate his best efforts to the cause of Business and Social Service, and to this end should pledge himself—

1. To consider, first, the interests of the subscriber.
2. To subscribe to and work for truth and honesty in all departments.
3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive.
4. To refuse to publish "puffs," free reading notices or paid "write-ups"; to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?"
5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity.
6. To solicit subscriptions and advertising solely upon the merits of the publication.
7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements, subject to proper and authentic verification.
8. To co-operate with all organizations and individuals engaged in creative advertising work.
9. To avoid unfair competition.
10. To determine what is the highest and larges function of the field which he serves, and then to strive in every legitimate way to promote that function.

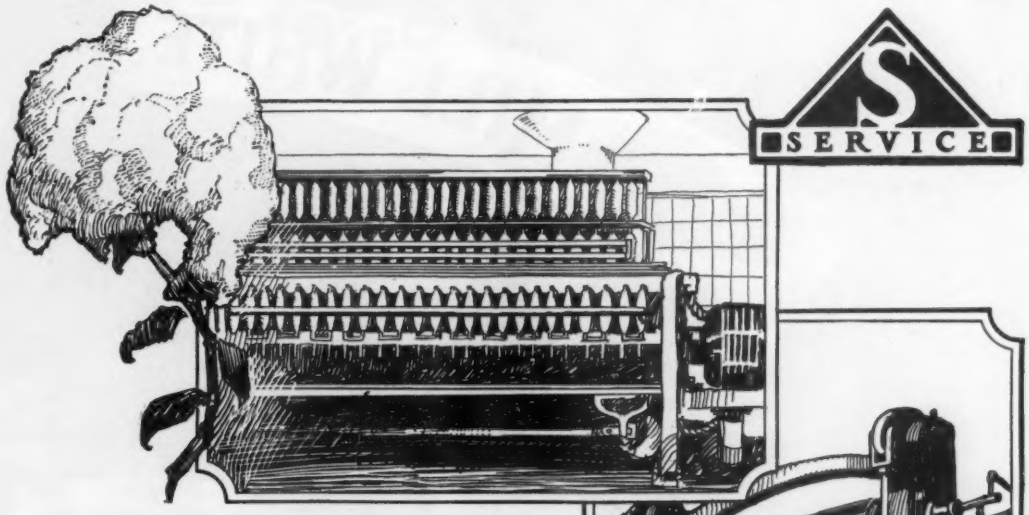
If you have read the foregoing standards, there is not much left to be said, except to tell you that these principles are present day *realities* not merely beautiful ideals for future attainment.

THE ASSOCIATED BUSINESS PAPERS, INC.

The International Association of Trade, Technical and Class Publications

220 WEST 42ND STREET NEW YORK CITY

THE FUNCTIONS OF THE ENGINEER



BETWEEN THE BOLL AND THE BOLT

FROM the time cotton is plucked from the boll until it is received in the bolt by the drygoods merchant or garment maker, it passes through a continuous series of processes either directly technical in character or controlled by means that involve engineering principles and technical experience.

Picking, carding or combing, roving, spinning, weaving, dyeing, bleaching, finishing or printing are all involved mechanical processes, in which the profit margin may be materially increased by the application of power, speed, drive, and correct technical principles.

It is one of the functions of the Engineer to guide his client in designing, building or rearranging his cotton mill so that he may reap this increased profit, through enlarged production, more uniform quality, a lower percentage of rejected product, and reduced manufacturing costs.

In serving several hundred clients in the textile industry during more than two decades this organization of Engineers has accumulated a fund of valuable experience which is available to its clients.

You will find "Picks to the Minute," an interesting little book on this topic. Your request for a copy will receive immediate attention.

J. E. SIRRINE & CO.
Engineers
Greenville South Carolina

Distributor Service

BOSTON, MASS.
Lewis E. Tracy Co.

CHARLOTTE, N. C.
Charlotte Supply Co.

FALL RIVER, MASS.
Wm. F. Harticon

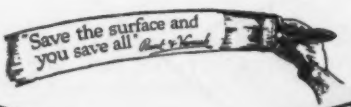
HOLYOKE, MASS.
J. Russell & Co.

ROCHESTER, N. Y.
F. P. Van Hosen Co.

SYRACUSE, N. Y.
Alexander Grant's Sons & Co.

UTICA, N. Y.
American Hard Wall Plaster Co.

WOONSOCKET, R. I.
J. B. Farnum Co.



Holmes Manufacturing Company
New Bedford, Massachusetts

To Improve Light Reflection

IN the making of fancy combed and mercerized yarns, good light is indispensable.

That is why the interior of the Holmes Manufacturing Company plant, pictured above, is painted throughout with OJACO Mill White.

And now—the walls and ceilings of every room in this modern textile mill properly reflect abundant light—on men, machines and materials.

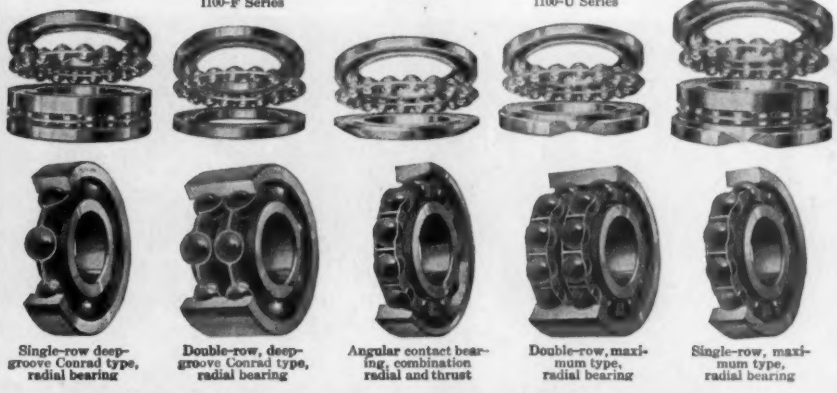
Upon request, the nearest OJACO distributor will furnish further details concerning the effectiveness and economy of OJACO Mill White for all textile mill interiors.

Oliver Johnson & Co., Inc.

Paint Makers since 1883

PROVIDENCE, R. I.

Strom BEARINGS


Double-acting thrust bearing, flat seats (grooved races) 2100-F Series
Single-acting thrust bearing, flat seats (grooved races) 1100-F Series
'Single-acting, self-aligning thrust bearing 1100 Series
Single-acting, self-aligning thrust bearing, leveling washer 1100-U Series
Double-acting, self-aligning thrust bearing, leveling washers 2100-U Series
Single-row deep-groove Conrad type, radial bearing
Double-row, deep-groove Conrad type, radial bearing
Angular contact bearing, combination radial and thrust
Double-row, maximum type, radial bearing
Single-row, maximum type, radial bearing

The STROM Ball Bearing Principle

The highest stage in the development of friction-reducing bearings has been reached in the Ball Bearing.

In this type the rolling element—a sphere—has the advantage of	*These advantages promote*	*All of which result in*
A single dimension	Minimum rolling friction	Smoothness and quietness of operation
Continuous working surface	Elimination of problem of aligning and adjusting rolling elements	Reliability
Uniform working surface	Accuracy of manufacture	Durability
Uniform shape	Perfection in finish	Economy
Uniform strength	Simplicity of construction	Efficiency

Any ball bearing having the STROM imprint can be depended upon as incorporating all of the qualities which are essential in a high-grade bearing.

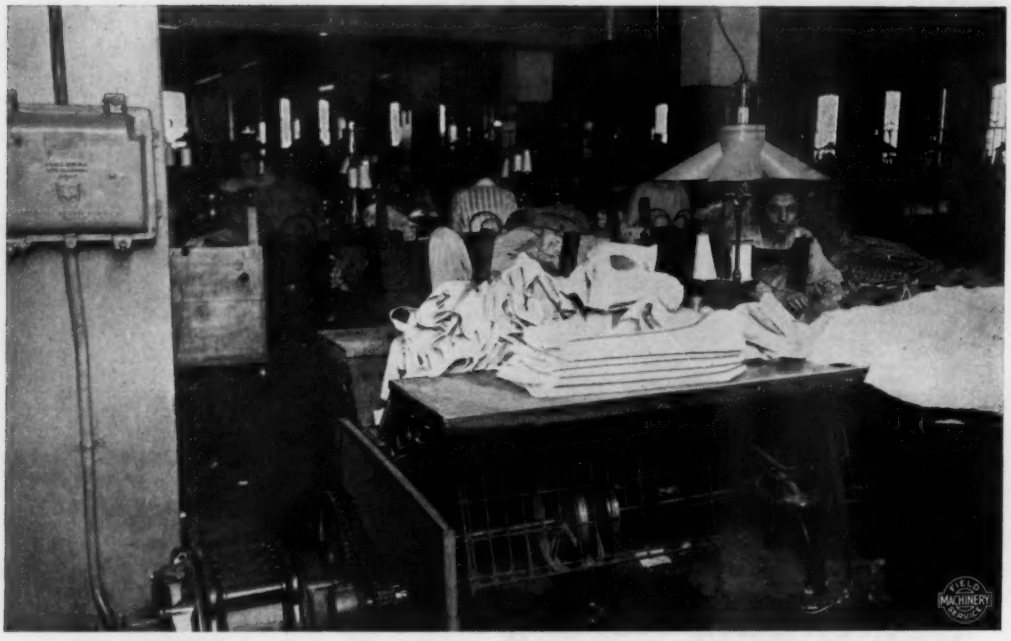
Strom BEARINGS

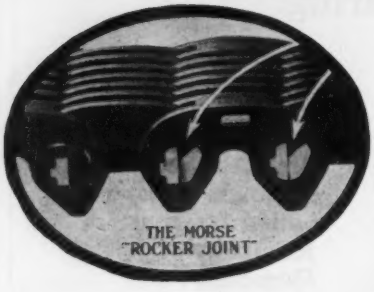
U. S. BALL BEARING MFG. CO.
(Conrad Patent Licensee)
4544 Palmer St., Chicago, Ill.

(1966)

MORSE SILENT CHAIN DRIVES

THE MORSE "ROCKER JOINT"





Chain vs. Muscle

Running a sewing machine in the garment department of this up-to-date factory is by no means a strenuous job. Each bench accommodates upward of 40 machines, operated by a long shaft which extends under the table and runs at 400 R.P.M. Shafts are individually driven by 5 H.P. induction motors, running at 1500 R.P.M.

Morse Chains are used throughout to connect the shafts with the motors. They were selected for this work because they are smooth running, quiet and require very little attention. The installation was made six years ago and has given complete satisfaction.

You'll find Morse Drives everywhere—from watch factories to rolling mills. Let us discuss their value in your plant.

MORSE CHAIN CO. LARGEST MANUFACTURERS OF SILENT CHAINS IN THE WORLD **ITHACA, N. Y.**

Morse Engineering Service BENEFIT BY MORSE SERVICE AS OTHERS DO *Assistance Without Obligation*

Address nearest office

ATLANTA, GA.....Candler Bldg., Earl F. Scott & Co.
BALTIMORE, MD.....1402 Lexington Bldg.
BOSTON, MASS.....141 Milk St.
CHARLOTTE, N. C.....404 Commercial Bank Bldg.
CHICAGO, ILL.....Merchants L. & T. Bldg.,
CLEVELAND, OHIO.....Engineers Bldg.
DETROIT, MICH.....7601 Central Ave.
KANSAS CITY, MO.....Finance Bldg., Morse Eng'rg Co.
NEW YORK CITY.....30 Church St.
MINNEAPOLIS, MINN.....So. 3rd St., Strong-Scott Mfg. Co.
MONTREAL.....St. Nicholas Bldg., Jones & Glassco Reg'd
PHILADELPHIA, PA.....Franklin Trust Bldg.
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock Bldg.
ST. LOUIS, MO.....Chemical Bldg., Morse Eng'rg Co.
TORONTO..Bank of Hamilton Bldg., Jones & Glassco Reg'd
WINNIPEG, MAN.....Dufferin St., Strong-Scott Mfg. Co.

"Morse" is the Guarantee Always Behind the Efficiency, Durability and Service

COCHECO BELTING

Pulls down power transmission cost.

It is not a cheap belting—but it **costs less per day of service** in places that require unusual durability and maximum power transmission.

Cocheco Belting is made from the firmest, toughest and strongest leather that it is possible to obtain—the strips taken from along the backbone of selected steers. These strips go through the slow, white oak bark process of tanning and are curried by our own special method—then stretched and properly dried.

Try one Cocheco Belt. Its service will recommend it for extensive use in your plant.

Every order shipped on the basis of "**money-back-if-not-as-represented.**"

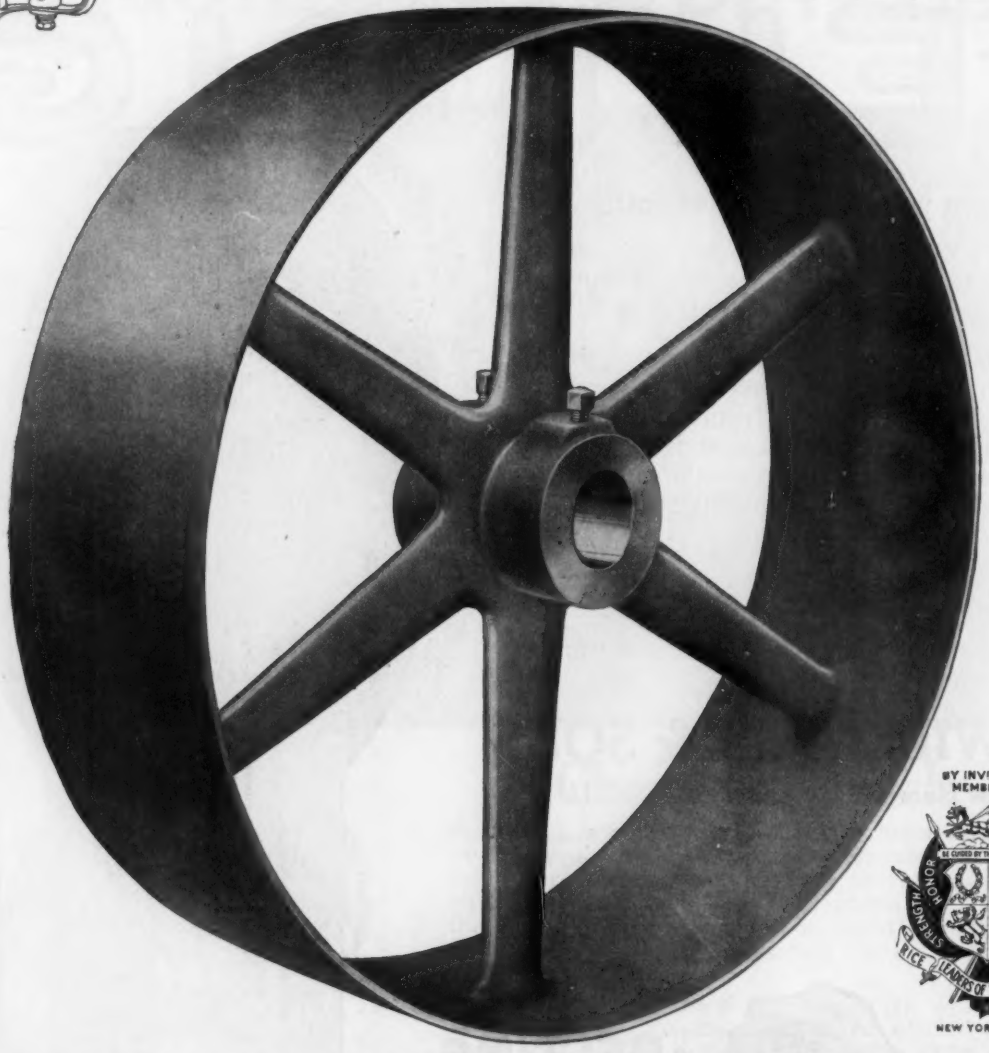
I. B. WILLIAMS & SONS

Dover, New Hampshire - - U. S. A.

14-16 N. Franklin St. Chicago, Ill. | **71-73 Murray St. New York, N. Y.** | **157 Summer St. Boston, Mass.**

COCHECO TRADE MARK BELTING

Quality Belting Since 1842



BY INVITATION MEMBER OF

NEW YORK, U.S.A.

IN THE FINAL ANALYSIS——CAST IRON PULLEYS

Have you ever thought of the pulley troubles you have had and how invariably the drive was made satisfactory by installing Cast Iron pulleys—either supplanting pulleys of some other type or by changing to cast iron pulleys of suitable construction?

BUT IT WAS A CAST IRON PULLEY THAT FINALLY STOOD UP UNDER THE SERVICE.

Almost every user of power has had this experience and always the solution of continuously satisfactory transmission service has been the installation of cast iron pulleys.

The use of cast iron pulleys in the initial installation will prevent trouble.

T. B. WOOD'S SONS COMPANY, Chambersburg, Pa.

Milton G. Smith, Southern Sales Agent, Greenville, S. C.

POWER TRANSMITTING MACHINERY

Is there a SCIENCE of LUBRICATION ?

We'll say yes—and we'll go further and say that we practice it.

The dictionary's definition of "science" is: knowledge classified and made available for work.

In supplying lubricants to mills, power plants, shops, steamship companies, railroads, trolley lines, public utilities, automobiles—and all the vast mechanical ramifications of the industries of this country and abroad, we have done more than sell so many millions of barrels of Texaco Lubricants.

We have observed, tested and checked the performance of different types of oils and greases under every kind and condition of work.

We have made deductions which are valuable because they work.

We have the knowledge.
We have it classified.
It is available.

This knowledge, accumulated over years of commercial success, has been correlated, and is available to all who ask for cooperation, advice and assistance in obtaining the right oil in the right amount for any purpose.

The medium by which our scientific inquiries in lubrication are made available to the industrial world is through the service of Texaco Lubrication Engineers.

When a Texaco Lubrication Engineer makes a recommendation as regards the kind and quantity of oil to use, he is speaking with more than the authority of his own experience, for back of him is the collective experience of a group of men who have been working with all kinds of lubricants on every possible type of power unit or machine.

So, then, if you have any lubrication problem—and every engineer or master mechanic has them once in a while—talk to our Engineers about the matter. Or write us.

Most careful attention will be given to any communication of this nature and we know that we can promise a prompt and satisfactory solution to any problem relating to the selection of lubricants for any purpose.

One More Thing

And that is to give you the opportunity of getting our Magazine "Lubrication." This magazine, published by The Texas Company, contains technical, authentic articles covering the use of lubricants in many industries.

Anyone, whose business or profession guarantees his sustained interest in this important branch of engineering practice, may receive it.

Thus the present list includes: Engineers, mechanical executives, purchasing agents, technical libraries, universities—and YOU, when you reach for your pen or pencil and do the necessary.

THE TEXAS COMPANY, U. S. A.
Texaco Petroleum Products
Dept. O, 17 Battery Place, New York City

Kindly put me on the mailing list to receive your magazine "LUBRICATION" Free for one year beginning with the March number.

Name _____

Street _____

City _____ *State* _____

3-23

Keeps Insurance Down

Keeps Machinery Up

This outfit (Fig. 63) eliminates the fire hazard by preventing oil spillage and waste. All the oil goes on the machinery—none leaks away.

Bowser Products
For Handling Gasoline and Oils Wherever Sold or Used

Filling Station Pumps and Tanks for Gasoline.
Portable Tanks for Oil and Gasoline.
Storage and Measuring Outfits for Paint Oils, Kerosene and Lubricating Oils.
Carload Oil Storage Tanks.
Power Pumps.
Dry Cleaners' Underground NapthaClarifying Systems.
Richardson-Phenix Oil Circulating and Filtering Systems and Force Feed Lubricators.

Write for Booklets

Folder A-45 tells why Bowser equipment saves money in textile plants. List of installations sent on application.

S. F. BOWSER & COMPANY, *Inc.*

Pump and Tank Headquarters

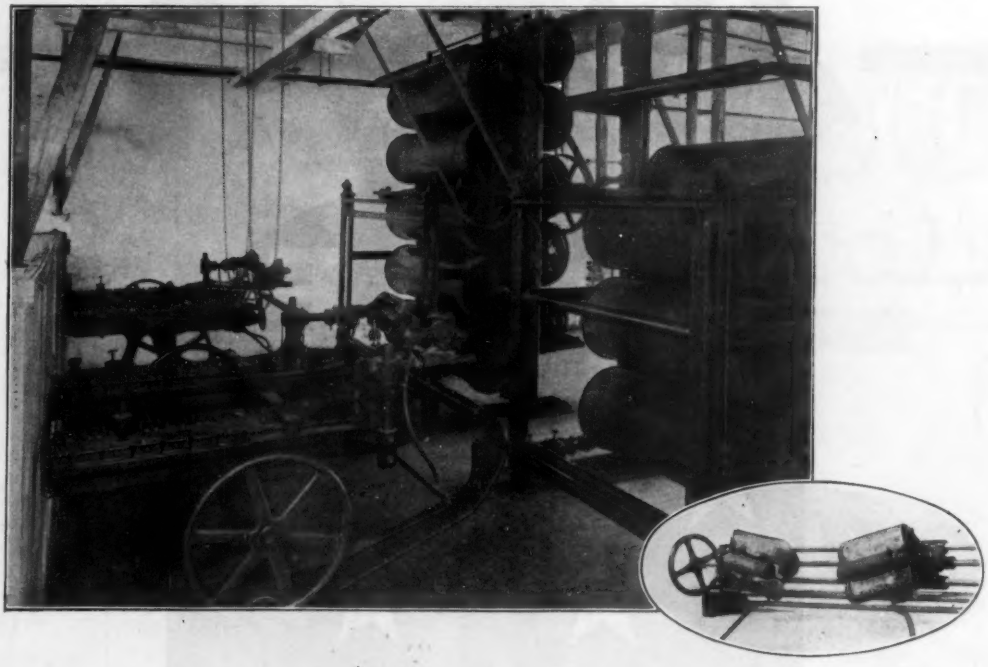
Home Plant: Fort Wayne, Indiana — Canadian Plant: Toronto, Ontario

Factories and Warehouses: Albany, Dallas, Milwaukee, San Francisco, Sydney

Branch Offices, with Service Departments, in Principal Cities in This Country and Abroad
Representatives Everywhere

BOWSER ESTABLISHED 1885

ACCURATE MEASURING PUMPS



"Up to date sixty Foxwells have been installed which has enabled us to reduce our normal force by 36 men"

The above is from an article "Increasing Finishing Plant Production," by R. A. S. Reoch in a recent issue of a textile publication. Foxwell Guiders, unerring, automatic fingers, besides taking the place of hand labor in feeding and guiding fabric on Tenters, Dryers, Calenders, Mangles, Padding Machines and Printing Machinery, eliminates seconds caused by selvage imperfections.

We show here a pair of Foxwell Guiders operating in connection with a Butterworth straight Automatic Tenter. Foxwell Pneumatic Guider and feeder are actuated by compressed air—10-15 pounds pressure is all that is required.

Fabric traveling through finishing machinery tending towards a serpentine motion, right to left, touches a sensitive metal upright or finger at either side. Instantly a valve is opened revolving a pair of cylinders, set at a slight angle to each other. These "nip" the material between them and center it absolutely in the machine.

Foxwell Guiders are made in the United States **only** by us. We will gladly send a book in which they are described and illustrated on various types of machines.

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA, PA.

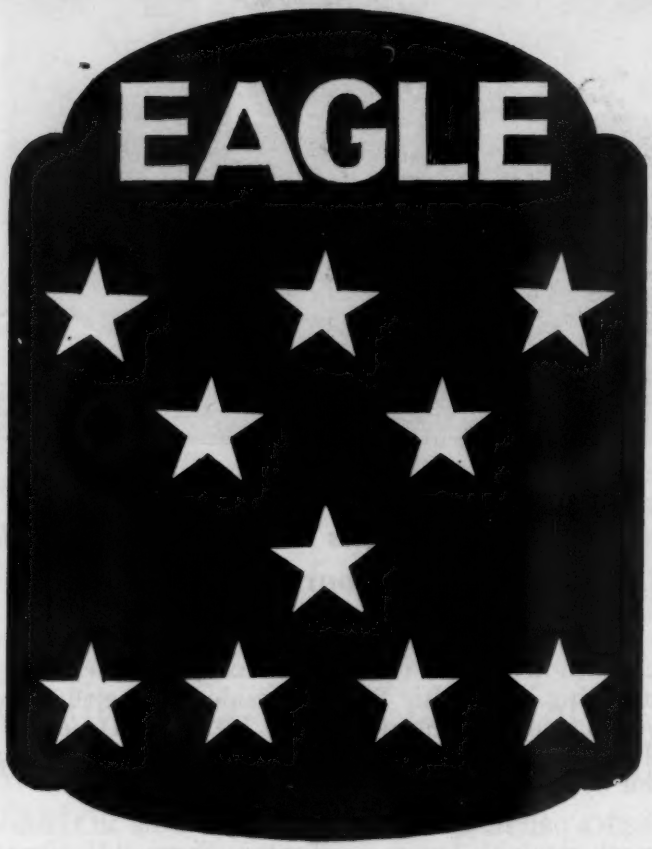
Providence Office
Turk's Head
Building.

Southern Representative
Milton G. Smith, Greenville, S. C.

Canadian Representative
W. J. Westaway Co.
Hamilton, Ontario, Canada

BUTTERWORTH *Finishing* MACHINERY

Starch



—and these stars have a meaning—

They signify the different grades in which Thin Boiling Eagle Starch is offered to the textile industry.

Being the pioneers in the manufacture of **Thin Boiling Starches** we are gratified at the widespread recognition they have received.

Be sure to select the best grade suited to your work. Our knowledge and experience are at your service.

Corn Products Refining Company

New York

Southern Office *Greenville, S. C.*

Starch

MATHIESON Chemicals

A New Feature of Mathieson Service

WE announce a unique and revolutionary advance in the marketing of Liquid Chlorine—the loading of our small cylinders with an even net weight of 105 pounds and our large cylinders with an even net weight of 150 pounds. An individual weight record of each cylinder is no longer necessary if you use Mathieson Liquid Chlorine.

This innovation is the result of many years of effort and is in line with other distinctive features of the service that has made us the acknowledged leaders in this field—the Mathieson Multiple-Unit Tank Car, the Mathieson Chlorine Valve, the Mathieson System for preparing bleach liquors from Liquid Chlorine and the Mathieson plan for cleaning, drying and inspecting all cylinder equipment before refilling.

The initiative and progressiveness of our Sales and Technical Departments have made these improvements possible. These departments of the Mathieson organization are always at your service.

Send for our descriptive booklet—

"Mathieson Chemicals for the Textile Industry"

The MATHIESON ALKALI WORKS Inc.
25 WEST 43rd STREET NEW YORK CITY

PHILADELPHIA
PROVIDENCE

CHICAGO
CHARLOTTE

EAGLE THISTLE PRODUCTS

Deal Direct with the Manufacturer

Beam Bleaching and Dyeing

(Brandwood's Patents)

Up to twelve Beams, or three thousand pounds and up to fifteen hundred pounds of CHEESES bleached or dyed, Indigo, Vat, Naphthol, Sulphur and Direct Colors ***at one operation.***

Cost in labor and materials guaranteed less than by any other System.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

Users of our Bleaching and Dyeing Plants have the exclusive free benefit of Twenty United States Patents, giving great advantages in Warping, Bleaching, Dyeing, Drying, Quilling and Splitting, and not available by any other System.

We further give the use of valuable secret processes, and many years' practical experience. We start up the Plants free, and give free service at all times.

Reckoned on basis of production, our Plants are cheapest in first cost.

We are prepared to install Plants and take payment, as and when saved by their use.

Most of the Chambrays and stripes now manufactured in the U. S. and Canada, are bleached and dyed on our Plants.

Exclusive Patent Rights are still available for some States and Territories.

Raw Stock Bleaching and Dyeing

(Brandwood's Patents)

Bleaching or Dyeing continuously in One Apparatus up to fifteen hundred pounds per hour, Indigo, Vat, Naphtol, Basic Developed, Sulphur and Direct Colors.

Cost in Labor and Materials guaranteed less than by any other system.

Dyehouse labor in handling the cotton before and after dyeing, and hydro-extracting is eliminated.

Three-fourths of the labor costs and three-fourths of the dyehouse floor space is saved.

Spinning production considerably increased.

No shortening, weakening or matting of the cotton.

Colors brighter and evenly dyed.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

We start up the Plants free and give free service at all times.

Exclusive Patent Rights are being granted to Colored Goods Manufacturers for their own State or Territory.

For full particulars apply to

JOHN BRANDWOOD

ELTON COP DYEING CO., LTD.

BURY, ENGLAND

A PRODUCT
MADE OF PURE WHEAT

(TO BE USED IN CONNECTION WITH YOUR STARCH)

—INCREASES TENSILE STRENGTH
—REDUCES SHEDDING TO A MINIMUM
—PRODUCES A WARP OF IDEAL WEAVING QUALITIES.

Soluble Wheat Starch Binder

IS RAPIDLY BEING ADOPTED BY PROGRESSIVE MILLS BECAUSE IT FILLS A LONG FELT WANT

STEIN, HALL & COMPANY

INCORPORATED

MANUFACTURERS AND DIRECT IMPORTERS

61 BROADWAY EXECUTIVE OFFICES NEW YORK

BRANCHES:

BOSTON PHILADELPHIA PROVIDENCE
CHARLOTTE GREENVILLE

WHAT WILL THE DYE DO ?

The right dye
—a "National" Dye—

will match a required shade perfectly. There is a "National" Dye for every standard shade. If fashion demands a new shade, "National" makes the new dye.

It will simplify your work to think of "National" first when you want a dye supplied—or a problem solved.

National Aniline and Chemical Co., Inc.
New York

Chicago *Charlotte* *Philadelphia*
Boston *Montreal* *Providence*
Hartford *Toronto* *San Francisco*

"NATIONAL" DYES
FOR TEXTILES

NATIONAL U.S.A. DYES

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. **R. W. PHILIP, Associate Editor.**

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Member Associated Business Papers, Inc.

Volume 87 **Member Audit Bureau of Circulation.** **No. 5**

CONTENTS

EDITORIAL—

Raw Materials 351
The Settlement with Great Britain 352
Spinners Meet at Spartanburg March 30 352

GENERAL AND TECHNICAL—

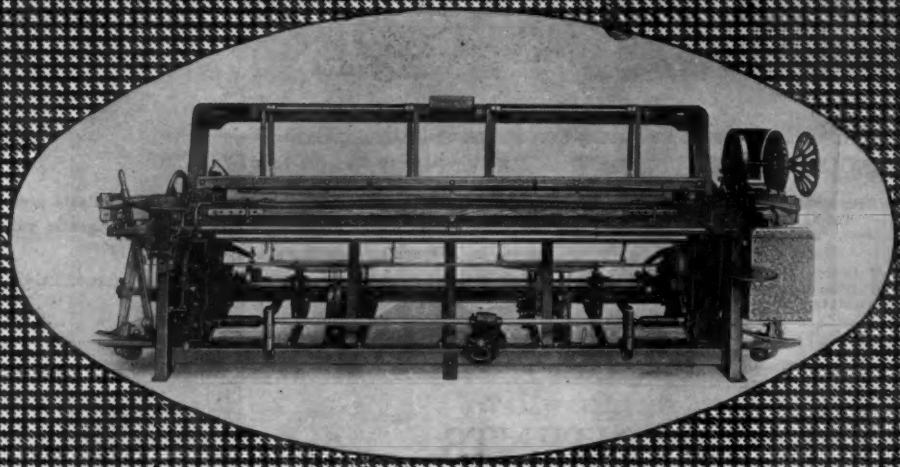
Individual Pay for Individual Production 353
A Discussion on Humidity and Its Effects 354
Storage Engineering 356
Beam Dyeing 361
Some Reasons for High Steam Costs 364
The Operating Executive's Opportunity 366
What the Southern Mills Are Doing 367
The New England Mill Situation 372
Cotton Comment 374
Conference for Control of Boll Weevil 374
Notes About Men You Know 376
An Old-Timer Says— 379

HOW OTHER MEN MANAGE—

Applying the Formula for Yarn Break on Adjusted Moisture Content 383
Why the Fingers Broke 383
The Holdsworth Differential 385
Licker-in Speeds 387
Eliminating Static 387
Making Two Sets from Eight Beams 389
Give All the Facts When Writing 389
Setting the Whitin Model C Comber 391
Overcoming Loose Threads 393
Use a Task Wage 395
What Causes the Spindles to Break? 397
Slubbers and Speeders 397
The Fly Frame Twist Problem 401
Variations in the Carding Department 403
A New Bunch Builder 403
Replies to the Questionnaire 405
Some Comments on the Anniston Meeting 409
Finding the Constant for Production 410
A Question on Balanced Twist 410
What Makes A Successful Foreman? 410
A Question on Sizing for Yarn Numbers? 410
Twist on the Spinning Frame 410

KNITTING SECTION—

The Manufacture of Cut Underwear 413
Among the Knitting Mills 419
The Knit Goods Market 423
The Yarn Market 429
Right to Restrain Misleading Advertising 430



A new broad automatic sheeting loom recently brought out by Hopedale Manufacturing Co., Milford, Mass.

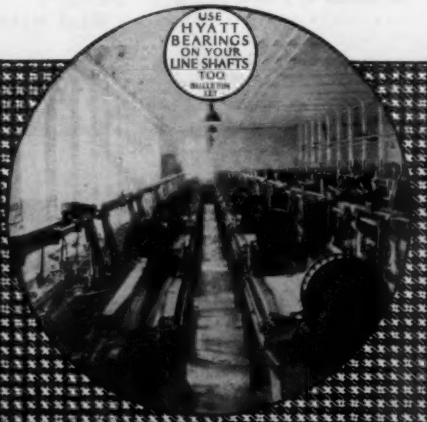
Carrying out their policy of building quality looms, the Hopedale Manufacturing Co., uses Hyatt roller bearings for crank and cam shafts of broad looms and also recommends the use of these bearings on narrow looms. Quality bearings are important parts of quality looms.

Advantages: exceptional bearing *durability* insures *dependability* of operation—*power saving,* average 20%—lubrication saving, about 85%—looms are easily turned by hand—elimination of friction gives smoother operation—bearings absorb shocks thus protecting crank shafts.

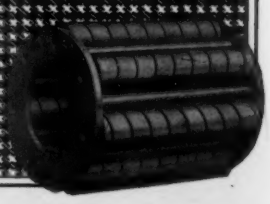
Secure these loom operating economies for your mill, specify Hyatt bearings—it pays.

Hyatt Roller Bearing Company

Worcester Newark Philadelphia



20 Hopedale Hyatt equipped 90" sheeting looms now in operation at Pepperell Manufacturing Company, Biddeford, Me.



With the Publishers

G. H. Millikan, President, New York, N. Y.
H. A. Hatch, Vice President, New York, N. Y.

V. M. Montgomery, Treasurer, Spartanburg, S. C.
R. G. Harper, Asst. Treasurer, Gainesville, Ga.

Gainesville Cotton Mills,

Treasurer's Office Spartanburg, S. C.

Mill Office: Gainesville, Ga.

Gainesville, Ga.

February 2, 1923.

L. L. Arnold, Editor,
COTTON,
Grant Building,
Atlanta, Ga.

Dear Sir:

We would like to know the address of the manufacturer who makes cloth room platform trucks. This is a truck that you push under small platforms in the cloth room; and, by working a lever, you carry the platform or the truck any place you desire.

We have seen the advertisement in the past--picture of a man with the truck in the cloth room transferring stacks of cloth on these small platforms; but now, that we like to buy one, find that he has stopped advertising or at least we can't find it in your magazine.

Yours truly,
GAINESVILLE COTTON MILLS

DWA/G

The foregoing letter from Mr. Anderson, general superintendent of the Gainesville Cotton Mills with 43,000 spindles and 1,220 looms, and manager of the No. 4 Mill of the Pacolet Mfg. Co., at New Holland, Ga., with 58,800 spindles and 1,765 looms, plainly illustrates two of our specific contentions.

1st. That cotton manufacturers read COTTON, advertisements and all, and remember what they read.

2nd. That sporadic or intermittent advertising often defeats its own purpose by leaving obstacles in the path of the prospective customer, while the advertiser whose announcement appears in every issue is always on hand, at the customer's elbow if you please, ready to serve him with pleasing promptness.

AMONG COTTON'S READERS

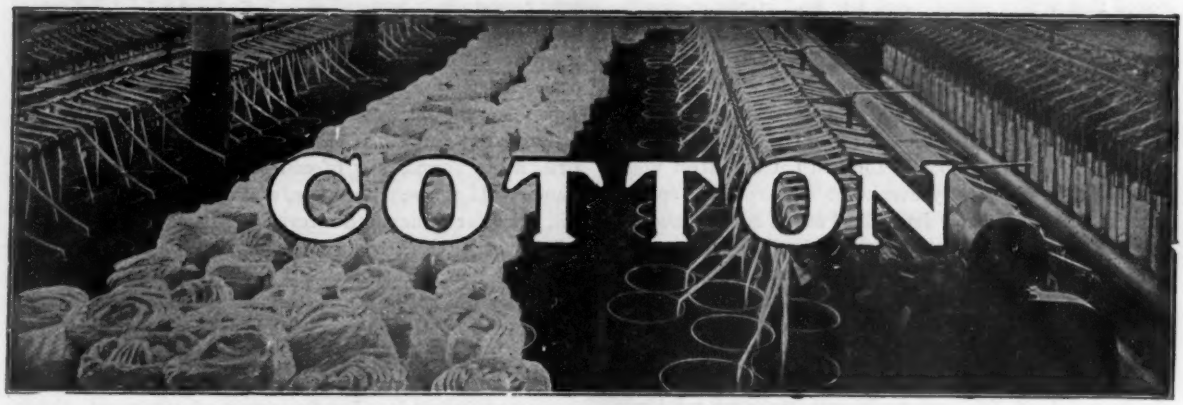
T. M. McNeill, Superintendent,

Monarch Mills,

Union, S. C.

"I have long been a reader of COTTON and have derived so much personal help from its pages that I would really feel selfish not to heartily recommend it to my friends."

T. M. McNeill



March, Nineteen-Twenty-Three

Raw Materials.

Recently much excitement arose in certain circles over a suddenly awakened consciousness of the situation of the United States with regard to crude rubber. A governmental edict put into effect in two remote localities, British Malaya and Ceylon, was followed quickly by the trebling, almost, of crude rubber prices. The burden of that increase in cost falls predominately on manufacturers and consumers in the United States. For we use about 70 per cent of all the crude rubber now produced.

But we produce none and therefore have no ready resource by which we may protect our interests. We must pay, for the present at least, whatever prices may result from the progressive export taxes put on rubber grown in British territory. About 70 per cent of all rubber now comes from the Straits Settlements and Ceylon, which hold in rubber production a supremacy exceeding our own in the realm of cotton production.

While no element of "hold-up" is clearly evident in the curtailment policy put into effect by the British, the situation thus produced emphasizes the potentially dangerous position we are in with reference to that basic product. For within the past quarter of a century rubber has become an essential, in both peace and war, of perhaps as great importance as cotton. The position we are in as to rubber supplies in many ways parallels the position we would be in if, with our textile industry as it is at present, we should depend wholly on, say, India and Egypt for raw cotton supplies. However, it is possible to change our position as to rubber, for it is practicable to develop at least safe reserve sources of crude rubber within or adjacent to our own domains. This ultimately no doubt will be done.

The rubber problem, as amplified during recent months, emphasizes the importance of giving more attention than, as a nation we have given, to the question of future sources of all basic raw materials. We have paid little attention to the subject for the reason that in the past, as well as at present, we have controlled more than, by even distribution, would be our proportion of these materials. We have more coal than any other country and at least as much iron, as well as most of minerals. We have had little trouble, so far, in getting ample supplies of those for which we depend on other lands. But the war disclosed how trouble might at any time arise with reference to them. In fact, the world war was precipitated very largely by the raw materials question, which has figured hugely in most of the struggles and world movements of the last several centuries. It was Europe's hunger for spices that had much if not most to do with sending DaGamma and Columbus and other explorers in the day of great discovery in search for quick passage-ways to the Indies. Scarcely more than a century and a half ago it was Europe's sweet tooth that caused both Britain and France to place greater value upon the control of the now forgotten island of Gaudaloupe than on the possession of all of Canada. It was Napoleon's turning to the sugar beet as a source of supply for that sweet tooth which led to the economic degradation of the West Indies.

Thus disproportionate control of important raw materials involves subtle problems for those who have, as well as for those who haven't. Sir E. Mackay Edgar recently pointed out how our supremacy in the matter of several basic raw materials already is threatening Europe with very vital economic problems. This isn't because we misuse that supremacy. It is because our control apparently is leading towards seeming control of the manufactured articles which come from those raw materials that we have in greater abundance than other countries. Steadily are we consuming more and more of our production of those materials in our own manufactures and are thus leaving less for other nations. He mentioned particularly cotton, in the production of which our supremacy has amounted to a semi-monopoly. A few years ago, he said, we consumed only 35 per cent of our cotton supplies. Today we take more than one-half and in ten years, he predicted, we will be using at least 70 per cent of our cotton. Therefore, if our supremacy in production continues the world would have to get from us the bulk of its cotton in the form of manufactured goods. Of course the world isn't going to do that willingly no more than we would voluntarily give up our rubber manufacturing industry to those nations which control the raw material. The cotton world outside of America thus steadily is being given additional incentive for the development, if possible, of adequate sources of cotton supplies beyond the control of single nations.

While progress, as expressed in actual cotton, hasn't yet been great it must not be forgotten that there is every evidence that soil and climate suitable for successful cotton growing is plentiful outside of the United States, just as it is for rubber growing outside of those regions that now

control crude rubber supplies. It also should not be overlooked that within recent years our lead in cotton production has receded, even though it is on account largely of reduction in the output of our fields.

What will happen in case cotton production in Africa, Brazil and Australia and other lands reaches the point where the world price will be fixed by the outputs of fields beyond our borders cannot be foretold but the effect would ramify into almost every avenue of our economic and industrial life. And that a determined effort is being made in this direction is evident from the irrigation developments already begun by the Brazilian government, and the offering of a bounty of ten cents a pound on all cotton produced in Australia by the Australian government.

Certainly as a people we should give more thorough thought and study to the problem of raw material production, not only that having to do with those we must procure elsewhere but also those which other nations get chiefly from us. Our practical cotton monopoly isn't a permanent fixture.

The story of rubber for the last twenty years shows how a production situation can be changed in a time so short as to be startling. In 1900 we were looking to the Amazon jungles for the bulk of our rubber. And Brazil, which controlled those jungles, believed that the world should always look to it for rubber. Then all at once the Brazilian rubber trees were transplanted on the other side of the world where it was unknown to nature. And today Brazil is but a minor factor in the realm of rubber supplies, which have been greatly augmented on account of the advent and growth of the automobile.

Until the war awoke it to the importance of the problem our Federal Government gave little attention to the intricate question of raw materials. It approached some phases of it from the standpoint of conservation and others from that of applied science. But not until two years ago were divisions set up in any government department for keeping detailed check on such things as rubber, cotton, steel and petroleum. Those divisions still are rudimentary and receive no great attention, even from interests directly concerned with the subjects handled. However, the recent hurrying to Washington of several of the big rubber manufacturers and the protests and appeals made there by them illustrate the importance of such work.

The Settlement with Great Britain.

While the British-American debt commission seems to have made—Congress consenting—a permanent settlement of our war debts claims against one former associate in the war, it is quite evident that the arrangement arrived at is a temporary adjustment only.

Interest to be paid for the first ten years will be on a 3 per cent basis. Payments on principal will total $23,000,000 for the first two years, and after that increase slowly, amounting to $30,000,000 at the end of ten years. After the first ten years, interest will be at the rate of 3½ per cent.

However, for the first five years one half of the annual interest may be added to the principal, thus making it possible for the interest for that period to be at the rate of only 1½ per cent. If the privilege of deferring one half of the interest for the first five years is exercised by the British the total payments to us by them will amount to less than $100,000,000 a year until the end of the first five-year period.

Hence it is apparent that the agreement entered into whereby the debts are to be refunded in cash within a period of 62 years, is essentially experimental. Nobody knows how the arrangement is going to work as there is no precedent for it. If it works advantageously to Great Britain our former ally of course will insist upon it continuing. If it doesn't work advantageously, many excuses will arise for demanding a revision. It may prove to be a subsidy of British trade with us, or with other nations with which we now do business. If this proves to be the case, the factor will not be a great one for the next several years on account of the comparatively small annual payments which must be made. At the end of five years we will know whether it pays to collect always in cash or its equivalent in goods. By the terms of settlement, Great Britain will pay, during several years at least, less than is paid from our Treasury on the Liberty Bonds that now cover the debts. The difference is estimated by some at more than $35,000,000 a year. And if one-half of the interest falling due during the first five years is added to principal and this deferred, actual total payments made to us during that period will be less than one-half of what the Government must pay to holders of Liberty Bonds of an amount equalling the indebtedness. The British are left free to pay any part of the principal at virtually any time, which under certain possible conditions might be a powerful trade weapon in their hands.

Spinners to Meet at Spartanburg March 30.

A meeting of the spinners' division of the Southern Textile Association will be held at Spartanburg, S. C., on Friday, March 10, it has been announced by John W. Clark, president of the Association.

This meeting will be one of the series of practical discussion meetings being held by the Association, and will be in charge of F. Gordon Cobb, general chairman of the sectional committee work, and Carl R. Harris, chariman of the spinning division, who will lead the discussion.

A large attendance of superintendents and spinning overseers and other operating executives interested is urged. This is the first spinning discussion meeting that has been held in something over a year, and a most interesting discussion is anticipated.

The operating executives, particularly those who were at the last spinners' meeting held in Gastonia in November, 1921, are expected to come to the meeting at Spartanburg prepared with their findings after conducting the various tests suggested at that meeting. (A complete report of the Gastonia meeting can be found in the December 1921 issue of COTTON by any mill men who desire to refer to the discussion at the meeting). A number of men have indicated that it is their purpose to bring the results of some of these tests, which will add to the interest and value of the discussion.

Any men who have baffling questions or problems relating to the spinning room are urged to bring these to the meeting for the discussion of the body. In accordance with the usual custom the meeting will probably open at 10 o'clock Friday morning, with an afternoon session at 2:30 o'clock, and a "Dutch" luncheon in between.

Individual Pay for Individual Production

BY GEORGE S. BROWN.

What is the biggest waste in a cotton mill?

It is paying for something that you do not get.

It is paying for 50,000 pounds and not getting it.

It is thinking that a man should do so much work for a certain amount of money and then paying him that amount of money but not getting the work.

It is admitting that all men are created equal and then going beyond all reason by trying to maintain that they remain equal.

To sum it all up, it is basing a man's worth at so much per hour spent in your employ instead of so much per unit of work done.

Who kills the most time in your plant? Who is the last on the job at starting time and the first to quit at closing time? Personally who, it is matters nothing, but you can safely wager that it is a time worker; one paid by the hour; one to whom you are handing good cash whether you get value received or not; one who needs a boss to get the most out of him; one to whom production means nothing else than more labor and thereby not to be striven for.

Even in these advanced times you will find many in positions of authority who maintain that time labor is superior to piece labor.

One of their arguments is that by putting through more production where the time worker is employed, your cost per pound is reduced, while where the piece worker is employed your cost is fixed and does not decrease with increased production. Or in other words, if a time worker processes 500 pounds of material in 10 hours for $4.00, by getting him to put through 600 pounds from increased speed or closer supervision in the same period you are cutting your cost 8 1/3 per cent. On the other hand, with the piece worker you pay a rate of 8 cents per pound and get 500 pounds which nets the worker $4.00. For 600 pounds you would be compelled to pay $4.80 which apparently does not show a reduction in cost per pound.

Now while the foregoing looks very well on paper, it doesn't work out so nicely in practice.

If you have a worker in your employ and have been paying him $4.00 for turning off 500 pounds (or less) of work, it is going to require more than speeding up your machines or extra oversight to put that man up to 600 pounds without increasing his wages. Today the employee very often knows a whole lot more about some things than his employer. The slogan today among employees is: "Get all you can for as little as possible." (Don't fool yourself in trying to believe this is not so.) And employers stick by the same standard. Well, why not? It is business. It is good business. Especially so for the time worker.

There isn't a job in your whole plant where a certain standard quantity isn't considered a day's work. And when you change the speed of machines you don't fool the employee into extra effort and further exertion to keep up. No! No! He doesn't do this. Not unless there's something extra in the way of remuneration coming to him. And then if he does get the extra pay, it's no guarantee that he will not later attempt to lay down on the job when the overseer's back is turned.

The time worker has lots of delays such as shortage of material, break downs, excuses, trips to the toilet, etc. In fact he has been known to create delays, as production means nothing in his life but more work. He shines the brightest at getting in his time.

Suppose he does kill time and get behind in his work? What then? Overtime at time-and-a-half is the answer. Or perhaps put on another man to help him out. You can't hurt his feelings by doing this. By paying a time rate you really encourage him to stall, and really, why shouldn't he? You offer no inducements, no stimuli to buckle down and dig in. Perhaps most likely the fellow right beside him is worse than he is. Is more of a dead beat and a time killer but the pay for both is the same. The only inducement offered in rivalry between the two will be to see who can do the least for the wages. Bear in mind that not every time worker is to be thus classed, but taken as a whole in the textile industry (and in a great number of others) employees do not plan to overexert themselves.

Now let's take a glance at the piece work system. You pay an employee a certain amount for a certain quantity of work in yards, pounds, numbers, etc., or whatever unit of measure you use. If you set your price fairly, and then just as fairly stick by it, you are going to see things getting done in your plant.

To get a fair basis to start with, take what you consider to be a good full production for a certain period, say a week for example, and since you know the weekly wage paid the time worker, by dividing this wage by the production you get the unit price. To further illustrate this, we will assume 2,800 pieces of goods folded in a week as a very satisfactory amount, in fact a little better than you actually average. You pay $24.00 a week to a folder operator. Then $24.00 divided by 2,800 gives .00857 per piece.

With this price established advise your employees on folders that they will get .00857 for every piece folded, and for them to "go to it." And believe me they surely will.

The industrious hand will get what is coming to him. Likewise so does the sluggard. Piece work goes a long ways towards taking care of the human element we hear so much about. And you can safely wager that if you can supply the work for these piece workers you will get the largest production from the least machines with the least supervision that you ever saw. The man whom you always had to push hard to get 2,800 pieces through, will climb to 3,200 just as sure as little apples grow. His $24.00 will grow to $27.00 and he is not only financially better off but also has a better frame of mind towards his job, for it is worth more to him. He cannot fail to see that he is getting paid for everything he puts through, and if he is ambitious, he will attain the maximum production and not be trying to hold back and do no more than the other fellow does. If he isn't ambitious on piece work, you can wager your last dollar that as a time worker he rated with a minus sign. You cannot weed him out too quickly.

Less machines and less employees are required to handle

a given production where the piece work method is employed than are required on a time pay basis and this means a reduction in overhead cost per pound. Some of the overhead items affected will be: equipment depreciation, supplies, power, compensation and other insurance, taxes, etc.

Now, when these employees have struck their stride and are at work before the last whistle blows and sometimes, perhaps, don't stop their machines until the speed shuts down and compels them to, *don't "spill the beans."* This has been done by a lot of over-smart employers. Some, too, who have been known to preach the "square deal" sermon. They actually are so narrow minded that they begrudge a piece worker his honest pay.

If an employee produces a certain amount of work at piece work rates and receives the stipulated price, he is by all reasonable and just thought entitled to 10, 20 or 50 per cent more pay if he produces 10, 20 or 50 per cent more production. A $24.00 man may earn $30.00 and he has to deliver the goods to do it, but some employers will then say: "Oh, say now! That's all out of reason. $30.00 for that sort of job? Ridiculous! We must fix this rate different. It's altogether too high."

Such a man adjusts the rate. He "spills the beans." He costs his company a whole lot of real money by putting a good big crimp in his production as well as increasing his labor turnover, for good operatives don't stand such treatment in these modern times. He may say: "There's plenty of other help." There is, but who wants it?

If a piece worker exerts himself and turns off an enormous amount of work, then by all means pay him every cent due him and encourage him to do better in the future. It means money to the plant.

Lots of us are greatly interested in our jobs. But to get right down to brass tacks, the more pay we get, the more interested we become. The more interested we become, the better work we are going to do. This holds true with the piece worker who is holding down a job where he can earn big pay. He is going to like his job. He is going to be jealous of it. He is going to do nothing that will put his job in jeopardy. And an employer who fails to rejoice with the employee at the fat pay envelope, is an ass instead of an asset.

The wise employer will go over his plant from end to end and study each department and each job. Then, where possible, he will establish piece work rates. If he is a man who talks cooperation between employer and employee, and he himself cooperates, the results secured are bound to be excellent.

If he thinks that he can establish piece work on a basis of a bigger production and no increased pay roll over what was in force under the time work system, he will surely get what he deserves—a good big jar. And the jar will begin with a capital J.

To sum it all up: A good man is worth more to his employer than an inferior one. Many of us find it difficult to pick out the good men and not include an inferior one now and then. Let the piece work system do the selecting. It surely plays no favorites.

A Discussion on Humidity and Its Effects

REPORTED BY JAMES ROBERTSON.

The fourth meeting of the series for textile operating executives, conducted under the auspices of the Associated Industries of Massachusetts was held at Fall River on Tuesday evening February 6th. The meeting was conducted by Louis H. Bell, secretary for the Association, and the subject of the evening was humidity and its effects. An interesting film, "Thirsty Cotton," was shown, and a lecture given by Thayer Francis of the Parks-Cramer Co., of Fitchburg, Mass.

Mr. Francis was introduced by Mr. Bell and before beginning the picture made some remarks on the history of humidity.

"I had prepared a set speech for this evening but I think that it is best that I discard it and just give you a few remarks upon the history of the art of humidifying," he said. "A good many of you will remember the days when all the humidifying was done by the use of watering pots, sprinkling water upon the floor. This was the only way that you could start your cards up in the morning. Most of you here can remember the steam vapor pots where steam was introduced into the atmosphere in order to raise the relative humidity of the room. And, too, we know why the mills first came to be built by the sea at New Bedford.

"The art of humidifying has developed into a specialty. We primarily do not wish to humidify the air, for that presents no advantage of any great importance to the art of cotton manufacture, but the main point of humidifying is to produce a certain amount of moisture in the cotton fibers to promote better conditions for the manipulation of these fibers. So if we produce a certain amount of moisture in the air then we introduce a certain amount of moisture in the fibers. That is the reason we humidify the air first. The only direct humidification that I recall is where an atomizer head is placed over the apron of the finisher picker to introduce moisture into the cotton directly.

"Now the subject of regain, which in terms of a definition is percentage of moisture content of the cotton, is the thing that affects the good results of humidification and we shall endeavor to show you by the aid of the slow motion camera, the microscope, charts and close-up pictures the advantages of this regain.

Explanation of Picture.

"The first picture shows you here the cotton in the bale form going into your opening room. Now this cotton is possessed of natural moisture and the amount of natural moisture is dependent upon when and where the cotton was grown and picked. Cotton that enters your opening room may have as high as 10 per cent moisture and the yarn or fabric that leaves your mill may contain only 4½ or 5 per cent moisture, a loss of 5 to 5½ per cent moisture. The proper amount of moisture that cotton should contain is given as a standard at 8½ per cent. And if you are not getting 8½ per cent moisture in your finished product then you are allowing an avoidable loss at your mill, one that might be corrected by proper humidification, which means production of quantity and quality.

"We will now take you into the card room. The picture shows you the condition of the web on the card when

insufficient humidification is maintained. The cotton does not contain enough moisture to kill the static devils in the fibers. The web constantly licks up, and notice the increase in loss by fly and cotton. We will now turn on the humidifiers and see how much better the web runs. This next picture was taken one-half hour later and all the static devils in the fibers have been completely drowned by sufficient humidity and the web runs along smooth and even.

"Let us now look into the condition of the drawing frames when the humidity is low. Notice how fuzzy the web is, especially along the selvage, notice the holes presented, under the slow motion, in the web. The fibers actually jump up to the top leather roll under the attraction of static charges. We will now turn on the humidifiers again and see how, one-half hour later, the web is now even, the selvages intact and no holes are observed.

"The next step takes us to the slubbers and here we have a few sights that the naked eye cannot see. Under this slow motion picture we can see the fuzz standing out on the strand, and also the accumulation of lumps at the top of the flyer that as soon as they are large enough go directly into the strand and present a lump that is a trouble maker later on. One-half hour of humidification again rectifies this trouble and the strand is smooth and even again, the twist running up to the bite of the front roll.

"We pass into the spinning room and under the slow motion camera that is only 1-14th the normal speed of the frame we will see two strands spinning, one under dry conditions and the other under proper regain conditions. These were secured by double exposure and the left strand you will notice is firm and even with no fuzz on it. The strand on the right, though it is actually the same number of yarn, is much larger and has a fuzzy appearance that rivals any bear. The first was spun under proper humidity conditions and the latter under dry conditions.

"To show you better how the humidity affects the strength of the fibers, we will place a sliver in the jaws of a breaking machine and under the slow motion camera, with poor humidity, we see that the fibers present little or no resistance to the pulling apart of the strand. The next picture shows you how under proper humidity the fibers cling together and actually protest against parting from one another.

"Piecings at the slubber are shown here, and notice how they present themselves finally in the form of slugs at the warpers which must be removed to make good presentable yarn.

"We tested some 17s yarn from the same bobbin under dry and under humid conditions and the picture shows the machine actually breaking at 84 when the atmosphere is dry and at 115 pounds when moist. This is an increase of 37 per cent. Some 30s lace yarn we tested went from a 76-pound break at 4 per cent regain to 100 pounds with an 8½ per cent regain, making a 32 per cent increase in strength.

"Our next picture takes us into the weave room and we see the effects of breakage due to bad humidity conditions. Breakage in the warps means defects in the cloth, causing seconds. Seconds cost more than firsts if the loom is stopped more in the making of them. Nothing in the weave shop will lend more to better running work than the proper humidity.

"Lastly we see our product leaving the mill. Are we sending with it the moisture content that is legitimately due it since we bought it as such? Proper humidity means utilization of all our cotton, less fly and waste, better running work, better quality and a larger quantity." The showing of the picture was concluded at this point. "I shall be very glad to turn this meeting into an informal discussion and am ready to answer any questions that I can," said Mr. Francis.

Practical Discussion.

One of the audience started the discussion by asking what method should be used to figure the moisture content of yarn.

Mr. Francis replied: "Take a sample of the yarn to be tested and place it in a glass bottle and seal thoroughly. This should be taken to a laboratory where it can be weighed very accurately. Next, place this yarn in a conditioning oven and dry the sample to a bone dry condition. The difference in weight after drying and before drying is the moisture content. To make this easier Professor Hartshorne has compiled his regain tables which depend on the relative humidity of the room and are the result of a long series of experiments. So by using these tables it is only necessary to know the moisture content of the relative humidity of the room. The relative humidity is usually obtained from the old style hydrometer and is more often than not incorrect. Why? Because they are not taken care of; the water runs low, the wick is old and dirty; and this instrument in most mills is entirely neglected. The best way to get standard humidity readings is with the sling psychrometer slung for twenty seconds and a reading taken immediately. This is the standard way of obtaining humidity used by the United States Weather Bureau."

The weather at this time outside of the building was one of steady snowing. Mr. Francis remarked about this and asked the audience to guess what the humidity of the room was. The guesses ranged around 40 to 50. Mr. Francis took a sling psychrometer out of his pocket and after swinging for twenty seconds found the humidity to be only 23 per cent with the outside atmosphere filled with snow and remarked about the fact that was what some mills were doing—heating the air up with steam heat and adding no moisture to raise the relative humidity. He added that it had been found that the Sahara Desert as a rule had more than 23 per cent relative humidity.

One man asked if the picker room should be humidified, to which Mr. Francis replied, "Some men believe in humidifying the picker room but others believe that humidifying the cotton in the picker renders it in a condition where the picker cannot separate the leaf and trash so readily as when the cotton is dry. And also with so much air coming in the picker room and being sucked out by the fans it is practically impossible to keep the room humidified properly at all. The only exception to this rule that I know of is in running bleached or dyed stock where direct application of moisture is obtained by placing an atomizer directly over the apron of the finisher picker."

The next question asked was in regard to the humidifying of the warehouses or shipping rooms. Mr. Francis stated that the cloth should be humidified up to the point of weighing but that it was not generally the policy for the mills to humidify the warehouses, though some do humidify the shipping rooms where the cotton cloth is weighed.

One of the audience asked how many cubic feet of space should be allowed per head and this question was answered

by B. S. Cottrell of the Parks-Cramer Company who stated that it ran from 12,500 cubic feet to 30,000 cubic feet depending upon the location and local conditions. In the South, in sections where it was dry it was necessary to allow as low as 12,500 cubic feet per head while on the water fronts in New England as high as 30,000 cubic feet is allowed; also Mr. Cottrell pointed out, in a narrow mill the moisture loss was more than in a wide one and a correspondingly lower number of cubic feet had to be allowed for the narrow mill.

Mr. Cottrell also spoke of the difference in regain in soft-twisted yarn and hard-twisted yarn and said under the same humidity conditions the soft-twisted yarn would absorb more moisture than the hard-twisted yarn. In tire fabric yarn it has been found almost impossible to get 8½ per cent regain due to the hard-twisted ply yarns. He remarked that in England every different class of textile fabrics had a set standard of regain for its particular class, based on the average regain for that particular fabric. "Since our climate is drier than the climate of England," he said "it would be logical to assume that we should have a smaller regain percentage. In the United States, however, no definite standards have been set; some take 7½ per cent as a standard while others assume 8½ per cent."

Mr. Cottrell continued by saying that Professor Hartshorne, in testing fabrics, had found that in light cheese cloth for an increase of 1 per cent in regain the fabric increased 3 per cent in breaking strength while with tire fabrics an increase of 1 per cent regain gave as high as 7 per cent increase in breaking strength. It was found that the breaking strength of the tire fabrics more than doubled from bone dry conditions to full regain conditions. The American Society of Testing Materials has set the standard for testing fabric as 70 degrees temperature Fahrenheit and 65 per cent relative humidity, the sample to be exposed for four hours.

Mr. Francis closed the meeting with the suggestions that each mill, if large enough, should give the care of the humidifiers to one man and that automatic regulators should be used or else the humidifiers would be like a horse without a driver; also that "good humidity will help very materially in making better quantity and quality for your goods."

Storage Engineering

BY R. A. SONIAMAN.

PART ONE.

A new discovery in textile manufacturing is that of the proper storage of material.

The increasing size of textile establishments, and the consolidation of individual units, more or less remote from one another, is bringing to light this important phase of the industry which hitherto has only been considered—when at all—as an everyday incident, a necessary evil, so to say.

Storage engineering, however, is bound sooner or later, to have a well-defined place in the scheme of mill management.

Storage itself is nothing new. It has always been part and parcel of the textile idustry; but since all angles of the latter are being analyzed in the hope of bringing about greater economies, so too, must storage go through the inquisitorial period.

Although mention has been made of the larger plants being the cause of storage being brought out of its gloomy mustiness, the problem of storage is just as important to the small mill.

In the larger plants, if not the smaller ones, the storage proposition often goes hand in hand with that of transportation. How to store so as to reduce the transportation is a tangle to be unravelled.

Such being the case, necessity—sometimes called the mother of invention—created by the urge of more adequate transportation, acts as the lever that puts storage engineering on the map of the mill plant.

It may be well to inquire into the meaning of storage so that all readers may have the same connotation of the word. A very simple, yet good definition of storing is "to put away something for future use."

Storage, then, is the putting away—more or less temporarily—of the different materials required in the regular course of textile manufacturing, from bales of raw cotton to the finished product, and from extra machine parts to supplies used in the process of manufacturing.

The object of storage engineering—scientific storage—is to so store material that there will always be a sufficiency without needless superfluity; that the material will be accessible at all times; and that it will be kept in a state of flux—the old going out, the new coming in.

In short, the keynote of storage engineering is to maintain the minimum supply of materials consistent with efficient operation, using foresight always, to stall off a possible shortage through any potential disturbance of the source or the carrier of the materials. This statement applies to incoming material, and also to the outgoing finished product.

The rise and fall of prices of purchased material and sold goods have an important part to play in the matter of storage. To explain: A sudden present drop of prices in raw cotton with the prospect of an increase of the same in the near future would naturally bring about a desire to purchase a large quantity of cotton.

Careless Storing.

To many mill men, the storing of material has no other meaning than that of packing something away. Whether it is packed neatly or otherwise, in the best place for it or not, whether little or much space is occupied—these matters bother them not at all.

Thinking men will readily concede that space is money, and that if it is needlessly cluttered up with all kinds of material, a loss is bound to ensue to the firm.

Neglected storage often results in insufficient material, going out or coming in, because the storing has been so carelessly carried on that there is no way of determining what quantities of material are actually at hand—whence, finally, there is a demand that cannot be filled. This is true in all the different stages of manufacturing from the raw cotton to the finished product as well as the adjuncts necessary to the carrying on of operations.

Going to the other extreme, it will be found that careless storage will often result in an oversupply of material,

be it cotton bales that have since dropped dollars on the market, to those supplies that are bound to deteriorate in quality long before they can be used up.

It is essential, then, when mapping out a storage program, to go, more or less exhaustively, over the material throughout the plant, making a note of the amount required to carry on the business adequately. Having once determined on the amount, an endeavor must be made to live up to the schedule. Obviously, some sidetracking will occasionally take place, but the plan can be comprehensive enough to permit some elasticity to take care of possible future variations in requirements.

Effect on Product.

It is self-evident that if a plant makes a product that varies but little, the problem of storage is greatly simplified.

Take, for instance, a yarn mill making two numbers only, one from 1-inch, the other from 1⅛-inch cotton. Storage room for only two classes of cotton is needed. Throughout the preparatory processes only two types of work need be followed up. Careful segregation of each class, moreover, will tend to further clarify the work of storage.

When, however, a half-dozen cottons are used, of various lengths, and divers shades, for all counts ranging from 8s to 200s, the storage of the material throughout the successive stages of manufacture is manifestly complex.

In this article, only the high places, so to say, of storage will be touched; for every plant has its own peculiar storage problems to handle. Those points, however, common to all mills will be more or less closely analyzed. To give sequence to the article, it may be well to follow the storing of the cotton in its various stages of manipulation throughout the departments of a yarn mill—a rather general type of a cotton manufacturing establishment.

It will be presumed that some kind of a cotton shed is available in which the bales of cotton may be placed. The bales can be packed in tiers by means of a portable elevator, care being taken, of course, that sufficient passageway is left so that the several types of cotton are readily accessible and can be taken out according to length of time stored—the old first, the new last.

If for some reason of urgency, as, for instance, in preparation against future expected disrupture of railroad or other transportation, and so on, cotton is purchased far in excess of immediate or normal consumption, the bales may have to be stored in the open.

In such a case, it is advisable to use planking on which to place the bales rather than to place them directly on the ground. Roofing or other heavy moisture-proof paper should be used to cover in the pile to protect it from weather inclemency. A temporary shed, if there is time, can be constructed; or a roof built over the pile.

In opening the cotton, the bales must be arranged according to the amount of room at the disposal of this process. With the exhaust type of conveying cotton from a centrally located opening plant, only one type of cotton is usually handled at one time. This simplifies the matter of storage.

The bins for the opened cotton should be roomy enough to permit a thorough airing of the cotton. Wire partitions permit a good circulation of air, but in order to prevent the several types of cotton from intermingling, the partition should be boarded for a distance of six or seven feet high with wire from this part to the ceiling. See Fig. A.

Storing of Picker Laps.

The storage of laps is more or less complicated according as there is a greater or lesser number of types of cotton. For instance, if a mill uses but two classes of cotton, two piles only need be kept. But if there are a half-dozen types, six piles are necessary. Where in the first place 25 laps of each of the two types might be a sufficient stock to keep ahead of the cards, in the second case, 15 laps of

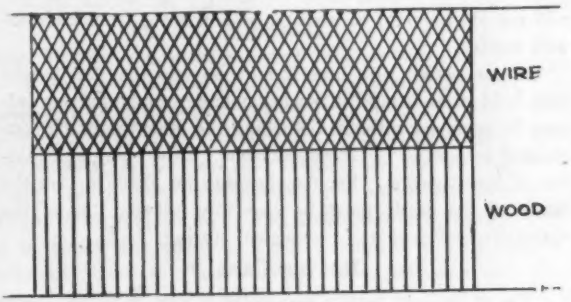


Fig. A

each of the six classes may be necessary. So that it is a case of finding room for 90 laps in the latter case, as against 50 in the former.

At this point it may be well to call attention to the somewhat anomalous nature of storage, which, while applied here to the laps, can cover the storage of the metamorphosing cotton during its entire period of manufacture.

It is: that the storage is of a temporary and yet a permanent institution; temporary, because the old should always be taken away before the new, and permanent because there is always about so much material to be stored.

It is expedient to have the laps piled between the lappers and the entrance to the card room. Fig. 1 shows a

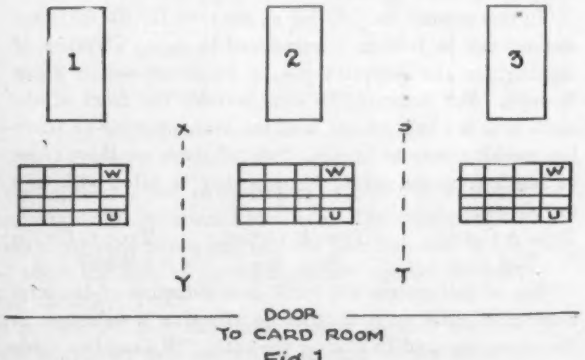


Fig. 1

picker room with 3 piles of laps of 3 different types of cotton, delivered by 3 finisher pickers, 1, 2, 3. XY and ST represent 2 railings that act as division or boundary lines for the several piles of laps. The laps are taken from the lappers and placed in the piles starting at the point u, and working toward w, one or two complete rows at a time. Next, another row or double row is formed adjacent to the first, again starting at the lap next to u, and so on, until the full storage room is taken up.

When laps are needed in the card room, the lap at u is taken first and then down to the end of the first row. The second row follows. After the laps from the lapper have been piled to the boundary allotted to that particular type

of cotton, the packing is started over again along the first and succeeding rows, which in the meantime have been removed to the cards.

In this manner, the laps are always in a consecutively progressive state; there is no confusion as to which laps to leave and which to take, and the danger of laps being left so long that they are covered with an accumulation of all kinds of dirt is obviated.

Should laps have to remain in a pile any considerable length of time before being used, coverings of a kind that will not shed should be used to protect them from undesirable matter.

In connection with laps it may be said that lap trucks that hold 4 or 5 laps in such a manner that any one lap may be removed without disturbing the others must be considered as part of the storage system. How many is a matter of investigation. So, too, keeping an extra lap on the back of the cards must be carefully adhered to, in the interest of efficient and economical storing.

Roving Cans.

The ubiquitous roving can which is such a potent, wellnigh indispensable factor between the front of the card right through to the back of the slubber, could fill up a chapter of its own.

Here is a good opportunity for the storage engineer to plan some economy for the firm. It is undoubtedly no stretching of the imagination to say that in many places the roving cans are rammed and jammed about rather indiscriminately without much regard as to the proper number to use.

Some plants have so many cans around that to prevent an absolute blockade of the cardroom, a cleanup is occasionally made, and the excess cans are poked into the cellar or some outbuilding. This practice may be all right where room is unlimited; but where space is money, better storage engineering must prevail.

In this respect, the coloring of the cans for the different sections can be favorably augmented by using a system of tagging for the several types or hanks of cotton going through. For instance, the cans between the front of the cards and the back of the next machine, drawing or silver lap machine, may be brown. Now, if there are three types or hanks from the cards, the cans may be fitted with tags as follows:

Type A Cotton	Type B Cotton	Type C Cotton
Red Tag	Blue Tag	White Tag

Use of this system will result in a reduction of the total number of cans required, thereby effecting a reduction in the space required in storing the cans. "Killing two birds with one stone," so to say. For example, it may be that the custom of distinguishing the several hanks is to paint a stripe on the cans—a different color for each hank. If three hanks are running simultaneously, it may be necessary to have 50 cans for each.

Assuming now that an emergency arises, a larger production of one of the hanks is required than has been customary to work through in a given time. In this event, the cans for this particular type will not suffice, and those of another stripe will stand about empty. To re-stripe the latter would take time; to use them as they are for another hank would greatly increase the probability of a mixture. Furthermore, it would signify an absolute breakdown of a system that had been intended to obviate mixtures.

Scientific storage, then, in such a case, it is safe to say, would use a more flexible scheme in designating the hank, as, for example, the colored tag idea, or some similar method.

To illustrate how the tag system would work in the foregoing emergency, it will be assumed that the normal number of cans previously found sufficient were:

No. A hank.....50 cans
No. B hank.....50 cans
No. C hank.....50 cans

Let the No. A hank be increased so that 20 more cans are required to handle the work properly; No. B and No. C hank being each able to get along with 10 cans less each. All that is necessary is to remove 10 blue and 10 white tags, and substitute 20 red ones.

Thus it will be seen that all the cans are utilized and that the storage room required is no greater than before. With the rigid system of stripping, however, there would at times be a superfluity of one kind which would entail a storage space probably quite in excess of that allocated to the cans, and so the cellar would be called upon to handle the extra cans. Not only would unnecessary space be taken up, but the money used in purchasing the extra cans would also be tied up.

The cans at the finishing drawing and evener processes may be of distinctive colorings to designate the particular machinery that they serve; i. e., front of evener to back of finisher drawing one color, front of finishing drawing to back of slubber, another color. The tag system, nevertheless, still holds good for different hanks at these processes.

Speeder Bobbins.

Conditions are changed when we come to the speeders, because a different system of storing takes place. On account of the increasing fineness of the strand, and its corresponding delicateness and susceptibility to injury, with no protection like that accorded by the roving cans to the sliver in the previous processes, greater care must be taken when storing away full speeder bobbins.

Furthermore, as it is usual to have various hanks turned out on the speeders, there ensues a multiplicity of hanks compared with the few, so to say, at the coarse end of the card room.

The usual practice, therefore, is to have racks or bins in which to pack the full bobbins, special pains being taken to properly designate the compartments for the different hanks, one hank only being allocated to one compartment at a time.

It is concededly a difficult proposition to find storage room in those mills that were built with the intention of running only a few hanks, but who now find themselves turning out a dozen or more hanks with a big variety in types of cotton. This is also true when there is an increase in the coarseness in the hanks because of the additional doffing, handling, and storing incidental thereto.

When only a few hanks are being run, the bin form is convenient, particularly if it is so located as to be easily accessible. It should be several inches above the floor to prevent damage should the floor be inundated with water from broken sprinkler heads, and so on. Covers should be used when the stock is slow in movement, so that fly waste and other foreign matter be not incorporated in the strand at the next process.

Pin boards, so called, either of wood, or metal, make

a handy storage assistant in that 40 or 50 bobbins can be taken care of at one handling, see Fig. 2, and can be re-handled and moved from rack to frame, etc., with impunity. Again there is an advantage in that the individual bobbins are not handled except at doffing and creeling, and therefore are not subject to being soiled or injured.

Special racks have to be built for these boards; likewise to facilitate transportation of several at a time, trucks that will accommodate themselves to the alleys have to be made.

Should it happen that too much stock is getting ahead of the several roving frames, cases or shooks of wood can

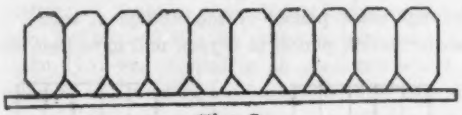


Fig. 2

be requisitioned, care being taken to see that the inside of the cases contain no rough places to tear up the delicate roving strand. Those lined with cloth are better,

For the empty bobbins, dump bins can be utilized; the idea, naturally, in this connection is to make them accessible to the workers. Furthermore, there should be enough bins so that different sized bobbins will not get mixed together. The prevalency of this nuisance is appreciated by every mill man.

One more word about speeder bobbins. Costing considerable money as they do, it is well for those who are looking into the storage of material to consider the matter of using one color of bobbins only, denoting the several hanks by different colors of crayon.

The result is something like this: If the room is a large one, instead of having a multiplicity of bobbins of various colors with stripes of every conceivable shade under the sun and a perplexing storage problem to solve daily, the coloring can be limited to just one shade for each process of speeders so that if the different sized bobbins do get into the wrong bins, they are immediately discernible. Which means, boiled down, less bobbins needed and less storage room.

In the Spinning Room.

Leaving the card room to go to the spinning, it will be found that the problem of storing the speeder roving arises here also, and racks can be used like those in the card room.

The practice of storing the roving boards on the floor in huge piles is not the best of practice; but if it is necessary to do, for instance, in the case of the speeders getting ahead of the spinning for one reason or another, the first boards should be placed on timbers or other material to prevent damage from scrubbing, sweeping, water from sprinklers, etc.

Since the movement of roving thus piled is often at a stagnation point, covers of some kind are needed to keep off extraneous matter.

As for the empty spinning bobbins, it is usual to store them in the boxes used in conveying the yarn from spinning to the spooling or weaving departments. Dump-bins may be used occasionally, but this form of storage is not always necessary.

The storage of the spinning boxes, however, often becomes a vexatious proposition. And the cost of a large supply of extra boxes is a point that must be borne in mind always. Not only is there the first cost of the extra boxes to be considered, but also the large amount of room required to store these boxes. Owing to the fluctuation of supply and demand between the spinning and spooling or weaving, it may be necessary for the storage engineer to call on the production manager to keep the boxes going and coming between the several departments at a predetermi balance. When packing spinning boxes in a room, the top boxes should be covered with cloth or other protecting material if full of yarn; but if the boxes contain empty bobbins, the upper box can be put on upside down to keep out the fly waste and other matter.

At the Winders.

When storage engineering comes into its own, so to speak, some of the mistakes made in the past in the layout of machinery will be avoided.

For instance: three or four decades or more ago, when mule yarns were largely used and frame yarn was still in its infancy, there was some excuse for crowded spoolers with little or no end room. The mule yarn was neatly packed in boxes that could be readily handled and there was sufficient yarn in one box to carry the workers over for some time.

But with the advent of the bigger ring spinning boxes and their comparatively smaller quantities of yarn the aspect of storage at the spoolers—and the layout of the latter—was radically changed.

The boxes are very heavy, almost too much so for some of the more delicate operatives, and there are so many more to handle for the same weight of yarn than with the mule yarn boxes that a more liberal space is absolutely necessary for the good of all concerned—workers and mill.

To illustrate how spooling storage can be successfully accomplished, Fig. 3 should be studied. It will be seen

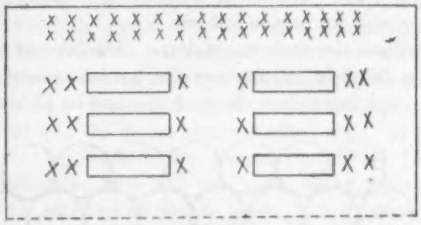


Fig. 3

that each spooler is like an individual unit, so that an ample passageway exists all around each one. The crosses represent spinning yarn boxes, and indicate how they can be disposed about the ends of the machines and against the wall, leaving the alleys free.

It is assumed that there are troughs on each machine for the temporary and convenient storage of the material and that the machines are equipped with empty bobbin conveyors, or at least have openings in the yarn troughs through which the depleted bobbins may be cast into empty boxes underneath the spoolers.

In the sketch, Fig. 3, it is assumed also that the machines are long spoolers of the drum type. For the shorter upright spindle spooler, two machines may be butted together, leaving the head ends free.

Spooler Products.

It is in the immediate storage and future disposition of the spooled product that storage engineering has an opportunity to test out different types of storing.

Modern spooling or winding is done on headless packages, of the rapid traverse type. To dispose of the wound product so that as little room as possible is used, and yet at the same time to have the packages in as handy a place as possible, the packages from the spoolers may be discharged into skips or cases, and from here packed away in conveniently arranged compartment racks closed in on three sides to keep fly and dirt from the product.

With the upright spoolers on which a smaller headed spool is made, the pinboard method of storage is a good The doffing of the spools is done on the boards which are suitably located right on the machines. They can also be readily removed to storage racks in specially constructed trucks so designed that they can be wheeled through the end passages.

It is entirely within the province of storage engineering to see that the storage racks for the yarn are so located as to make access easy to them for depositing the product of the spoolers, and for the removal of the same for the replenishment of the machinery in the next process.

In fact, storage engineering must always be on the alert to further to the utmost the efficiency of the manufacturing process.

On comparing the two types of storing the wound packages from the spoolers—the pinboard system and the skip-and-pack method—it will become apparent to any one who has seen the two systems in action that the skip-and-pack is the most economical one for the big headless tubes. The reason is that on account of the tubes being so large only a few can be put on a board for easy handling, a condition that would obviously entail a large number of boards. This would become an item of first expense, with an ensuing result of a not inconsiderable expenditure for upkeep of the boards.

But for small headed spools, the pinboard system is unquestionably an economical one.

If twisters are used, one striking advantage of the pack system in headless spools over the headed spools must be voiced. And this is that the packages can be placed on top

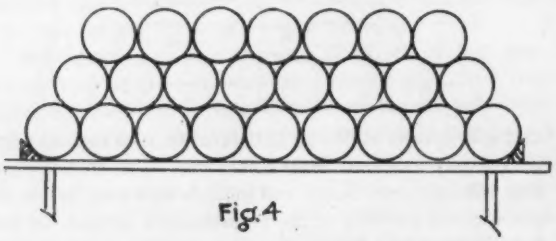


Fig. 4

of the twister creels to 4 or 5 rows deep without danger of toppling over, or being inconvenient for the operatives to get at. Fig. 4.

With the pin-board type used for the smaller headed spools, only one row of boards can be put on the creel tops. To put on a double row means making it harder for the workers to get at the spools and involves the removal of the top boards to give access to the lower ones. A glance at Fig. 5 will illustrate what is meant.

By using the skip-and-pack method and stacking several rows on top of the machines, the tax on rack or storage space is also lessened. This method of utilizing the creel tops is like making a building several stories in height. No more ground space is required.

Full warping or twisting beams, on account of their weight, present a phase of storing that does not appertain to bobbins and spools of previous processes. If beams are stored indiscriminately, there is always the possibility that a certain beam may be called for that will be in such a place that it will be impossible to get at it without disturbing a dozen or more other beams.

This statement applies especially to the method once used in a large tire fabric establishment of placing a row of beams on the floor, then putting planking over this row and rolling on another layer, and so on. A very neat way of disposing of beams is to have runways in tiers, so that each row is independent of the others.

Although some phases of the storage of cotton during its transformation period in a yarn mill have been more or

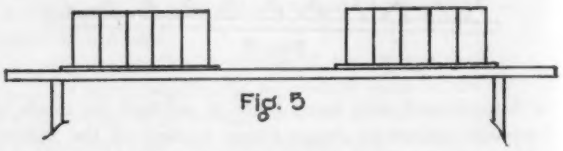


Fig. 5

less exhaustively touched upon here, there is undoubtedly much that has not been dwelt upon at all. Nevertheless it is believed that the matter of storage has been sufficiently aired to give the reader an idea of its importance in the various processes of cotton manufacturing.

[This is the first of two articles on Storage Engineering. The second will appear in an early number.—Ed.]

A Device for Tying Weaver's Knot.

Announcement has recently been made by the Barber-Colman Company of Rockford, Ill., that their automatic spoolers are now being equipped with a knotter for tying a weaving knot as distinguished from the round or "chicken head" knot which has always been the product of mechanical knotters in the past. This change will be welcomed by many mill men who have frequently expressed a desire to secure such a mechanical knotter for their work, inasmuch as it is conceded that the weaving knot is in many ways superior for certain kinds of work.

Announcement.

It has been brought to our attention that the series of articles entitled "Determining Cost in a Cotton Mill," which were published in COTTON from September to December, 1922, inclusive, under the name of Benn Kershaw, were acquired by him from a copywrighted textbook entitled "A Method of Determining Costs in a Cotton Mill," published by Henry W. Nichols, principal of the Bradford Durfee Textile School of Fall River. As we are advised that Mr. Kershaw did this without the permission and consent of Mr. Nichols, further publication of articles on this series will be discontinued.—Editor.

THE COTTON INDUSTRY, by J. H. Crabbtree, 123 pages. 34 illustrations. $2.00 per copy.

Written by H. M. Inspector of Factories in the Lancashire district of England, this volume tells, in plain terms, the important features and processes of the cotton industry in England. The English manufacturing industry is alone considered; after dealing with raw cotton production, ginning, etc., the book goes into the history of the industry.

Beam Dyeing

BY H. JALA.

Industrial development brings, inevitably, new processes. Old ideas give way to new, old methods are superseded by others more accurate, more efficient. In no industry has this been more evident within the last few years than in dyeing.

Formerly, when the colors available were but crude extracts of vegetable or animal, or occasionally, some mineral matter; of doubtful composition and dyeing property, the open vat method was the only practical one. The material to be dyed was steeped in an open tub where it could be watched and worked continually until it had absorbed the required amount of color, when it was taken out. With the advent of scientifically constructed synthetic dyestuffs of level dyeing properties and uniform tinctorial strength, a change of method became possible which has, in the last few years, developed into what may, in a general way, be called package dyeing.

Package dyeing differs from the old method in that the material to be dyed, instead of being passed through the liquor, is held stationary while the liquor is pumped through it. It is questionable whether this method will ever be satisfactory for piece dyeing, but it has been in successful operation for a number of years with raw stock, and is rapidly gaining in popularity for yarn dyeing. A number of machines have been placed on the market for accomplishing this work, all of which use the same method of operation and vary principally in the size of the package handled. The yarn in every case is wound on some form of tube which is of sufficiently open construction to allow the passage of the dye liquor and is then placed in the machine which pumps the liquor through it, first one way and then the other, until a proper dyeing is obtained.

The advantages over the old method are obvious. It is possible to use a smaller proportion of dye liquor. This means less dye and a more complete exhaustion of the bath, resulting in a marked economy where high priced dyes are used. The yarn, being in a more compact and easily manipulated form, is less liable to damage. It is simply placed in the machine, dyed and taken out. Contrast this with the long chain system where the warp must be wrapped with a cord to prevent tangling and is then repeatedly passed through a series of rollers where it is sometimes very nearly worn out before it is dyed, dried and delivered to the beaming room.

For the ordinary colored goods mill the package method that appears the most efficient is the dyeing on the beam itself after the yarn has been warped. It is applicable not only to yarn that is to be woven into cloth, but also to yarn that is afterward to be quilled or twisted, and presents the desirable qualities of a maximum package with a minimum of handling and waste. With a beam dyeing equipment there is practically no difference in the handling of the yarn between a white mill and a colored goods mill, except that in the colored mill the yarn makes a few hours pause in the dye house between the warper and the slasher. The saving in time alone of such an arrangement can best be appreciated by those who know what it is to fret all patience away while waiting for rush patterns to get through the beaming room. The financial saving in the complete elimination of the beaming room is left to the calculation of those who have one to contend with.

For mills contemplating the installation of a beam dyeing outfit, however, there are a number of matters which should receive careful consideration, chief among which is the quality of the water supply. This is always an important point in dyehouse work, but becomes especially so where the water is to be pumped through the beam. The closely wound yarn makes a first class filter which will strain out any calcium or magnesium salts, which may have been thrown out by the soda ash in the bath, suspended vegetable matter, or just plain mud. These deposits will form a scum over the yarn on the outside or the inside of the beam and will not only foul the color in those places but will actually interfere with the circulation of the liquor to such an extent as to make uniform dyeing impossible. Very hard or dirty water, therefore, is, on the whole, impracticable, although either defect can be corrected with a satisfactory filtering system, and the precipitation of sediment in the machine can be avoided, to a certain extent, by the substitution of Turkey red oil for soda ash in the boil. Even with the best of water and care, the wire beam barrel, after repeated dyeing, will become clogged with an accumulation of lint and trash which has to be boiled off every so often.

Suitable Handling Equipment Necessary.

Provision must also be made for the proper handling of the beams. The beam barrel, being made hollow for the passage of the dye liquor, is larger than ordinary. This makes a large, unwieldly beam which when filled with yarn will weigh in the wet condition up to a thousand pounds and it is not possible to handle it without occasional injury to the yarn or the beam heads unless adequate equipment is at hand. An overhead track is preferable, but if this cannot be had and the beams must be rolled about on trucks, there should be chain hoists placed for lifting them off the trucks to the floor and vice versa, and for placing them in the dye machine or slasher creels. An ideal arrangement is one that connects the warper room with the dye house so that the beams can be doffed off the warpers and carried to the dye house and either placed in the dye machine or on the floor without any intermediate handling.

Money spent in this direction is well invested. Careless or rough handling in this case means bent or broken beam heads and that inevitably means that on the warper the selvage cannot be run as close to the beam head as is necessary. On ordinary work a bad selvage gives trouble enough, but when it is remembered that in beam dyeing the liquor will always go through a soft place in the beam in preference to the more closely wound portion it is easy to see that a soft ended beam is fatal to good work.

Watch the Warpers.

Successful beam dyeing calls for practically perfect work on the warpers. When the liquor is circulated through the yarn it must circulate evenly to produce even work. This means that the yarn must fill the beam from one head to the other with equal density at every point, and also fit snugly against the beam head to prevent un-

due leakage of liquor at that place. Warper combs must be kept in perfect condition, and some form of positive expansion comb must be used, so that the threads will be spaced evenly. With the best of care a spring comb will eventually give way so that the yarn will be spaced more openly toward the ends than in the center and while this defect may be so slight as to be imperceptible, it will make a beam that will be hard in the middle and soft at the ends,. When dyed, the circulation will be good through the loosely wound yarn and poor where it is tighter with the result that ends will be well dyed, with light or altogether undyed streaks in the middle. Furthermore, bent or broken teeth or any other irregularity in the spacing of the comb will produce high or low places on the beam which will show up in the dyeing as light streaks or channeled places.

On the whole it will be found desirable to make a rather loosely wound beam, as this allows a free passage of liquor. This can be accomplished by running as light a weight on the drop roll as is possible without letting the yarn kink, and running the beam over instead of under, that is, having the top of the beam turn toward the operator, as this puts less strain on the yarn. While it may be found somewhat irksome at first to get the desired quality of work from the warpers, the benefit derived from the improvement in the running of the work on the slashers alone will make it worth while.

Dry the Warps Before Slashing.

It will also be found necessary for the best results to install dry cans behind the slashers to dry the yarn thoroughly before it goes into the size box. While the beams are pretty well rid of water in the dye tub, they are not dried completely and the only way this can be done is over dry cans. An old slasher cylinder will do if one is handy, but it is best to get a set of dry cans built for the purpose. The set consists of two cans which are placed between the creel and the size box. In this way the yarn is dried to a uniform degree before going into the size. This arrangement is not absolutely necessary except where a good finish is required. It is quite possible to size the damp yarn so that it will weave fairly well, but as the water cannot be uniformly extracted in the dye tub, it will vary the amount of size taken up with a consequent variation of finish.

The Dyeing Operation.

For the operation of the beam dyeing machine it will be found advisable to select a careful man who is already familiar with the handling of the various classes of colors. While the machine itself is not complicated nor the operation difficult to learn, the personal element enters into beam dyeing to a considerable degree. The machine consists primarily of a tub into which the beam is placed, and a pump to circulate the liquor. The discharge pipe of the pump passes through the end of the tub, terminating in a gland to which one end of the beam is clamped and with which it is revolved slowly during the dyeing. This turning over motion contributes to the evenness of the dyeing. There is also a large tank used as a storage tank for standing baths and a smaller, circulation tank into which the dye and chemicals are fed during the dyeing process.

A beam being placed in position ready for dyeing, the tub is filled with water until the beam is covered and the water heated by steam pipes in the bottom of the tub. The pump is then started and the water is forced into the barrel of the beam through the end which is bolted to the gland. As the other beam head is solid, the water must, perforce, go through the yarn, and this is done at a pressure which does not go over ten pounds per square inch when conditions are right. After going through the yarn, the water passes out of the tub, through a drain pipe which takes it to the circulation tank from which it is drawn again to the pump and a circulation is thus continued from the inside to the outside of the beam. After the chemicals for the boil-out or the dyeing have been introduced into the circulation tank and run for a certain length of time, a lid is let down on the tub and bolted tightly into position. By a change of valves the circulation is then reversed. The liquor, passing into the bottom of the tub is forced through the yarn and finds its way through the beam barrel to the circulation tank and back to the pump again, a circulation being thus maintained from outside to inside. These processes are reversed for various lengths of time until the dyeing has been completed.

After washing, the yarn is freed of excess water by the use of compressed air. Some centrifugal wringing system whereby the beam could be whizzed like the basket of a hydro-extractor would probably be more efficient, and machines for this purpose have been built. There are a number of colors, however, such as indigo, which must be oxidized during the dyeing process, and it is a very satisfactory arrangement for the air to serve the double purpose of oxidizing the color and blowing out the liquor at the same time.

The Human Equation Important.

The final success of the operation depends to a great extent on the man in charge of the machine, for the reason that no two colors behave alike and the different periods of circulation are never equal, but must be determined by experiment. The reason for this is probably the difference in the amount of yarn exposed on the inside of the beam as compared with the outside surface. In other words, the bore of the beam is never as large as its outside circumference and the circulation from outside to inside is almost always longer than the reverse. A skillful operator, by releasing the pressure to a certain extent back into the circulation tank and by other careful handling, can often make a successful dyeing of a beam which a less experienced or less careful man would either channel with excessive pressure or dye unevenly with a faulty circulation. While this sort of trouble does not occur to any great extent after the warper room help have been trained properly, still, imperfect work will occasionally slip through, as every one knows, and in a case where a streaky beam will spoil several thousand yards of cloth, the man who can save the situation when it does come up is valuable.

Like every good thing, beam dyeing has its defects. To a dyer who is used to the chain system, the most evident fault is the impossibility of telling to what extent the beam is dyed on the inside. Nor is there any way to remedy this except, possibly, to put a swatch of yarn inside the beam barrel. Even this would not be satisfactory, because the beam would have to be taken out of the machine before the swatch could be examined, and even if the outside and the inside of the beam were of the right shade, the middle might be off and there would be no way to tell it until it was run off on the slasher. This is a defect for which there is no remedy, but which gives no trouble when the machine is properly handled. Beams can be

dyed evenly and colors matched satisfactorily by a competent operator.

Another trouble which will show up when the machine is first put in is that beam dyed warps are almost always duller in shade than those dyed in the chain. Just why this should be so is not positively known, but the fact remains that with the same dye, the chain method will give a much brighter color. However, this is not an insurmountable difficulty. Beam dyeing is no new thing and dye companies are fully acquainted with its peculiarities. They are always ready to lend their advice or assistance in finding ways to brighten up old colors, or in substituting new ones of the required brilliance.

The third and probably most serious defect of the single beam machine shows up in the making of chambray or solid color patterns, and to a certain extent, wide checks or stripes. There are machines with a capacity of five or six beams, in which enough beams for a set can be dyed at one operation and the same shade obtained on all of them, but with a single beam machine it is a very difficult matter. Practical dyers know that however exactly dyes are weighed out, or however carefully the operation is performed, variations will occur between batches. Whether due to dye, cotton or operator, they are there and must be taken into consideration in the run of the work. For this reason, while it is being done on lower grades of chambray, it is not advisable on a high grade of solid patterns or wide stripes to attempt to match up a set of four to six beams, supposedly of the same shade, all of which have been dyed separately. Small stripes or checks will deceive the eye, but as the stripes get wider, variations between threads become more perceptible, and one beam a trifle off shade will produce a stripe within a stripe; an effect which cannot be said to be regarded with favor by the trade at the present time.

In regard to the handling of the various classes of dyes on the beam machine, there is not a great deal to be said. The making up is virtually the same, the application slightly different. Below are a few general formulae which are working successfully at the present time.

Direct Colors.

After placing the beam in the machine, boil-out with clean water, using either soda ash or Turkey red oil according to the nature of the water. If the water is soft, soda ash can be used. If hard, it is advisable to substitute about two per cent of Turkey red oil, and after the boil-out a little of the oil can be left in the bath. Circulate from the inside out and after getting to a boil, close the lid and boil for half an hour. After the boil-out this liquor is either run off, or retained for the dye bath, according to the dye. If run off, fresh water is added, brought to a boil or whatever temperature is required and half the dye added in the circulation box. The dyeing is always begun with a circulation of outside in for the reason that if the liquor is too hard to get through the yarn at the beginning, which sometimes happens, there is less danger of channeling the beam this way than the other. The dyeing operation generally consumes about an hour, the circulation being 20 minutes × 15 minutes × 15 minutes × 10 minutes, beginning with outside in and ending with inside out, the other half of the dye being added at the beginning of the first inside out period and at the beginning of the outside in period. The lid is then raised and the beam washed from inside out until the water is clear, when it is blown dry with the compressed air. There is a certain class of direct color which can be applied on a bleach bottom by bleaching and dyeing at the same operation. This is done by the addition of sodium peroxide to the dye bath, and produces excellent results. Most direct colors, especially light shades, dye more evenly starting at a low temperature. This applies also to

Sulphur Colors.

On account of the extreme solubility desired for this class of work, it may be found more difficult to select a line of sulphur colors. Even when apparently perfectly soluble, some dyes have the quality of being hard to force through the yarn which increases the risk of channeling. In fact it seems impossible to apply some colors without channeling somewhat, even though the channels may not be large enough to be of any consequence. This is not a peculiarity of sulphur colors, but applies to some of all kinds, and these of course should be avoided. It is not at all impossible to select a line of sulphur colors satisfactory both as to solubility and brightness of shade.

After placing the beam in the machine, boil out with soda ash or Turkey red oil, circulated from inside out. Close the lid after getting the boil, reverse the circulation to outside in, and half the dye liquor and run 20 minutes. Reverse the circulation to inside out, add the balance of the dye liquor and run 15 minutes. Reverse the circulation to outside in, add the required amount of salt and run 15 minutes. Reverse the circulation to inside out, run 10 minutes and while on this run raise the lid. Oxidize with the air if necessary, wash until cold, then heat the water to 120 degrees and wash until clear of sulphide. Blow dry with the air.

Developed Colors.

Primuline can be used as an example of this class of colors, all of which are handled much the same way. The Primuline is dyed an hour at a boil just like any other direct color, the circulations being 20 minutes — 15 minutes — 15 minutes — 10 minutes, starting with outside in and ending with inside out, the lid being raised on the last change, and all further operations carried out with the lid up and an inside out circulation. A wash of a few minutes is given until the water runs clear and the beam is cold, when the diazotising bath is introduced into the circulation box and run until a good color is obtained, which will be about 15 minutes. It is then washed again until clear, about 15 minutes, and developed. The developing bath will take about 15 minutes to produce the fully developed color, and after that there will be another 15 minutes wash which is heated to 160 degrees during the run. The beam is then blown dry. In spite of the apparent complexity of the operation, Primuline is one of the most satisfactory dyes for this work. It never channels a beam and never fails to produce an even shade.

Vat Colors.

This class of dyes presents some difficulty because of the presence of caustic soda in the bath. It appears that the well known mercerizing action of the caustic contracts the yarn to an extent sufficient to require considerable pressure to force the liquor through the beam. A high pressure from whatever cause increases the risk of channeling, and a channeled place of any size on a beam renders the even dyeing of that beam impossible. For that reason, while vat colors can be successfully applied, they must be handled more carefully than others.

Boil-out for 30 minutes at 180 degrees F. with 3 per cent soda ash, then cool to 90 degrees F. and add to the bath, glue 2½ per cent, caustic 1½ per cent, hydro 1½ per cent and Turkey red oil 2½ per cent. Run this ten minutes and then begin to work into the circulation box the dye, which has previously been reduced with the necessary caustic and hydro in twenty gallons of water. Dye thirty five minutes at 90 degrees F. as follows, beginning with outside in 4 × 3 × 8 × 6 × 8 × 6. Raise to 120 degrees F. and dye twenty minutes, 10 × 10. Air and wash with 1½ per cent perborate of soda at 180 degrees. Blow dry.

With indigo the method is somewhat different. The standing bath is sprung with caustic and hydro and the required amount of indigo, which has been properly reduced, is added to it. It is then pumped directly to the dry beam without any previous boiling out. This circulation is from an hour to an hour and a half for the heavy shades and is altogether from the outside in except the the last ten minutes during which the lid is raised. After the liquor has been pumped back into the standing tank, the beam is oxidized with the air, then washed until the water runs clear. The water is then heated to 160 degrees F. and 1 per cent ammonia and 2 per cent Turkey red oil added and the wash continued for a few minutes after which it is blown dry and taken out.

Bleaching.

Bleaching can be accomplished with excellent results in the beam machine. It is of course necessary that both the beam and the machine be either made entirely from, or else lined with, some substance not affected by the bleach liquor such as lead, aluminum, monel metal, etc. The circulation of the liquor can be maintained entirely from the inside out and bleach machines can accordingly be made without a lid. The operation is very simple and requires only ordinary care for good work. After a boil out of an hour and a half with Turkey red oil, the bleach liquor is circulated for about an hour, or until the desired bleach is obtained after which the anti-chlorine is run for 15 minutes The beam is then washed with clear water and blown dry.

These few formulae are not intended to be laid down as rules of operation but only intended to convey in a general way the impression that in beam dying the modus operandi is not at all complicated nor difficult and that with proper care and intelligence a great saving can be accomplished in labor cost and a great improvement effected in the running of the weaving over the long chain system. There is no doubt that it has its own peculiarities and drawbacks, as has any industrial process, but it is safe to say that within its proper field it has no competitor.

Some Reasons for High Steam Costs

By C. T. BAKER.*

In a great many localities the cotton mills have found that on account of their proximity to hydro-electric transmision lines, and in some cases large and efficient steam electric plants, it will pay to close down the mill power plant and to purchase power from the electric companies, who by reason of their large and efficient plants can supply the power and lighting requirements of some mills at a cost which represents a decided saving to the mill owners in favor of purchased power.

However, in mills where electric current is purchased from outside sources, it too often happens that the plant operating crews appear to lose interest in the boiler plant, and as a consequence much of the saving gained, due to use of purchased power, is offset by losses in boiler plant operation and maintenance. It is obvious, of course, that a certain amount of steam is necessary regardless of whether or not the mill is electrically driven. In the winter considerable steam is required for heating the building in addition to the other steam demands; consequently, the total boiler horsepower requirements of many mills during several months of the year is considerable.

Recognizing that many of the losses occurring in mill boiler plants are preventable losses and that there is little or no excuse for their existence other than ignorance, laziness and indifference, the following suggestions are offered with a view of assisting those in responsible charge of operations in removing the causes of these preventable wastes and thereby bring up the overall boiler and furnace efficiency to a standard approximating that which should be rightfully expected of any given installation.

*Consulting Engineer, Atlanta, Georgia.

Excess Air Losses.

Doubtless the greatest single cause of low boiler and furnace efficiency, and therefore high fuel cost per boiler horsepower developed, are the losses incident to excess air. By excess air is meant that amount of air entering the furnace over and above the amount of air actually required to support combustion for any given fuel. Theoretically, it requires 11.6 pounds of air by weight to burn one pound of carbon; however, since coal, for example, is not all carbon but contains a variety of other ingredients, it requires from 20 to 40 pounds of air per pound of coal to support combustion. Therefore, the difference between the theoretical quantity and the quantity practically needed is the excess quantity or excess air.

Excess air may enter the furnace through the grates due to too thin a fuel bed or holes in the fuel bed, also excess air may enter the furnace above the fuel bed through holes in the furnace walls, and very frequently cold air enters the combustion chamber through defective brickwork. In fact, cold air will enter through very minute openings or pores in any part of the brick settings, around poorly fitted fire, combustion chamber and clean-out doors, etc. A little reflection will show that cold air entering the boiler furnace or combustion chamber or any part of the boiler setting other than through properly controlled channels (the furnace, above and below the fuel bed) is detrimental to economy. Consider for the moment the effect of using say 62 pounds of air per pound of fuel burned, which condition is not at all uncommon, and think what it means to heat up this quantity of air to furnace and combustion chamber temperatures and recall that much of this total quantity of air escapes to the stack carrying with it large quantities of heat.

It is not hard to visualize what such a condition will do for the coal pile. As a matter of actual fact it will represent a preventable loss of 41 cents for every dollar spent for fuel.

Is it not time to ask ourselves the question, "What must we do to be saved?"

Remember that cold air entering the boiler settings simply acts as a sponge, soaking up heat and carrying it to waste.

Knowing the cause of this waste it is not difficult to apply a remedy. First, go over the entire setting from top to bottom with a lighted candle, locate and mark all places where the candle flame is drawn in, then follow up with permanent repairs.

After it is thought that the job is complete close the damper after a fresh fire and note whether or not smoke escapes at any places around the setting. If smoke will come through any opening or crevice with the damper closed, air will enter with the damper open.

After the settings have been made tight, see that they are tested at stated intervals in order that future losses may be prevented. Brick are porous and any boiler wall will pass cold air through these pores due to the difference in pressure inside and outside of the furnace and combustion chamber.

To prevent this air infiltration to the furnace and other parts of the setting the brick wall should be whitewashed or, better still, coated with some good plastic covering material such as is marketed by several well known concerns.

Should there exist any doubt in the mind of anyone regarding this question of the property of porosity of brick, the matter may be easily decided by weighing a brick that has been dryed perfectly, then weighing the same brick after having kept it submerged in water for about ten minutes—the difference in weights noted is the answer.

To be effective and productive of permanent results, all tests and repairs must be carefully and completely made and absolutely no part of the brick setting or boiler covering should be overlooked.

Draft Dampers.

No boiler plant should be operated without dampers provided in the stack or breeching for the proper control of the draft. Most boilers have too much draft and while this may appear as an incorrect statement of conditions it is nevertheless true.

It is a fact, of course, that many stacks and stack breechings are overloaded in carrying away the great weight of excess air previously mentioned and that to afford sufficient draft under conditions of defective brick work, the condition responsible for most of this excess air, it is necessary to operate with the dampers wide open. However, it usually happens that when all air leaks are stopped that there is too much draft and that the dampers may be partly closed with economical results. A great deal of heat, and therefore a great deal of fuel is wasted because of too much draft. When a furnace is being supplied with sufficient draft to maintain the desired steam pressure and at the same time show the highest practical CO_2 content in the flue gases, any further opening of the damper will operate to defeat the laws of economy.

The amount of draft required for any given boiler will depend on several factors, such as character of fuel, type of furnace, per cent of boiler rating, i. e., steam demands, etc. However, by means of a draft gauge and a careful study of conditions it will be possible to determine the correct draft for all conditions and the dampers calibrated accordingly. Each boiler should be equipped with a simple yet inexpensive draft gauge and a flue gas thermometer, otherwise it is not possible to tell, except by general indications, just what is actually taking place in the furnace. To these simple devices should be added a simple hand CO_2 machine for determining the CO_2 percentage in the flue gases.

Losses Due to Dirty Boilers.

A matter frequently neglected is that of keeping the fire side of the boiler tubes free from soot and ash deposits and the water side of the tubes and shell free from scale and sediment. Where boilers are operated twenty-four hours per day, it is absolutely necessary that the tubes be blown with steam at intervals of not exceeding twelve hours, otherwise the soot deposits will become so heavy as to materially reduce heat transmission and increase the heat losses to the stack. The temperature readings of the flue gas thermometer will indicate when the tubes are becoming dirty and need cleaning.

In the case of water tube boilers, high flue gas temperatures often are the result of defective baffling. There is probably more fuel needlessly wasted due to improper and defective baffles than is generally supposed. Good baffles, properly maintained are essential to economy in any water tube boiler setting. In localities where the feed water is bad it is usually necessary to wash or otherwise clean the inside of steam boilers from two to three times per month in order to secure the highest evaporation of pounds of water per pound of fuel consumed.

Here again hit and miss methods of procedure too often prevail and only half way results are obtained. To be effective, boiler cleaning must be thorough, otherwise the expense of cleaning and repairs will be out of all proportion to the benefits obtained.

The 1923 edition of Hendrick's Commercial Register of the United States has been issued. This, the 31st annual edition of this register, contains 150 pages more than the 1922 edition, and over 125,000 changes and additions have been made in this year's edition. Over 18,000 products are separately classified with the name and address of every manufacturer or producer, together with the trade name or brand (if any) and also essential facts regarding the products of many of the leading firms. These classifications are made of easy reference by a handy system of indexing and cross-indexing. All the manufacturers and others included in the register are also listed in one alphabetical section according to name, and all brands, trade names, etc., are arranged according to name in one alphabetical list with the name and address of the manufacturer following.

The lists in the book completely cover the electrical, engineering, machinery, building, manufacturing, chemical and other industries, together with all allied industries. The lists are for the use of both buyers and sellers. This publication is a widely known and used annual register. The present edition contains 2482 pages. The publishers are S. E. Hendricks Co., Inc., 70 Fifth Avenue, New York City. The register is a part of the Hendricks' information service, which also includes their commercial bulletin, a monthly supplement, and the information bureau which obtains special information for subscribers to the service.

The Operating Executive's Opportunity

Suppose a deal was put through tonight whereby you would buy the department for which you are now responsible, and would give your promissory note in payment for it. Consequently you will start in Monday morning to run that department on your own responsibility. In order to conduct a business of your own you must have imagination, courage and a real fondness for hard work, After acquiring this new business, are you going to sit down with the thought in your mind that everything is running pretty smoothly, saying to yourself, "I guess I had better let well enough alone?" If you do, your ownership of the business will be very short lived, and the sheriff will soon paste a notice on your door advertising a foreclosure sale.

Joel M. Barnes, consulting textile engineer, presented this interesting hypothesis in an address at a recent dinner of the superintendents and overseers of the Manhasset Manufacturing Co., of Putnam, Conn., and his solution points out a pertinent moral which should be appropriated by every operating executive in the industry. In supposing on what would actually happen were the foregoing condition to become a fact, Mr. Barnes continued:

"What I suspect will happen is this: You will take a pencil and your notebook, and start in to make a survey of your new business, sizing up the 'weak points,' for everyone knows that the strong points will take care of themselves.

"You will go over your speeds, machine by machine, to see if you are getting every possible pound out of each, with due consideration for the age and condition of the equipment and also the quality of the cotton being processed.

"You will go carefully over the waste situation to see what is really happening. Although you may have been in close touch with this department for years, I venture to say that in the light of ownership your eyes will see things which they were not focused to see before. You will figure how much it really costs for labor and overhead expense for cotton which you have to rework, to say nothing of the loss caused by the waste made which has to be sold.

"Then you will take up your payroll, going carefully over the entire list of operatives, asking yourself, 'Could I get along without some of these people?' Your next step will be to make a detail study of the operations on various machines, confronting yourself with the question, 'Can I get more and better product from these operatives if I am able to work out some different scheme of rewarding them for increased efforts?'

"Finally study diligently the duties of your so-called general help, and decide whether or not each has a full day's duties, and performs them satisfactorily.

"It may happen that in the midst of this investigation you will become discouraged. If so, no matter what department you may happen to be in charge of, just take a walk up to the spooling room and watch some of the efficient spooler tenders. These operatives are always a real inspiration to me, making me realize what a well trained operative can do if she has the proper incentive. Do not lose sight of the fact that there is a difference between being strenuous and efficient. You and I have seen reeler tenders make motions so fast that you could not follow them with your eye, and yet some apparently slower motioned woman alongside of her would turn out a greater number of pounds week after week.

"Some of you may find that you need some changes in your equipment, but remember that you own the business now, and will have to take all responsibility for the necessary expenditures. However, do not forget this: 'We pay for the things we really need whether we buy them or not.' Sometimes we pay ten times over, but still go without the benefits of the things we need so badly. If you want your superintendent, who is now really your banker, to take an interest in your proposals, you must write them out and show exactly what they mean in real United States dollars.

"After you have progressed this far, it would not surprise me if you called in your second hand and said: "See here, Bill, here is the situation,' which you will describe to him in detail, 'Now I need your help, and I am willing to sell you a one-third interest in my business,' and if 'Bill' is the right sort he will take an interest in the game and become in a real sense your junior partner.

"Some day I would like to write a tribute to the 'second hands' in cotton mills, because I believe they are the first lieutenants in the front line trenches. They represent, to a large degree, the management as far as the individual operative is concerned, and some day their influence for good or bad will be better appreciated by the heads of concerns.

"Let us suppose now that you have convinced the superintendent that some of the things you have outlined are okeh, and you have put them into practice. After a while I will wager that you can show some honest-to-goodness savings which you can measure in real money. You will then walk up to the office of your superintendent (banker) and place your statement on his desk. When he has carefully examined your report you will say to him: 'Do you not think it is about time to declare a dividend?' and I suspect that he will agree with you and take action accordingly.

"In the meantime you will have set up standards for production and labor costs on each grade and size of product you are making with which you will compare week by week your actual performance. If you will start a chart showing this comparison you will have ever before you a vivid picture of what is happening, and a true conception of the general trend of your progress. You may desire some help from the outside in doing this, but never lose sight of the fact that if you fail to take a 100 per cent interest in this yourself, your rate of dividends will be cut down and may vanish completely.

" 'We get out of things about what we put in,' is a law of nature, and we cannot successfully go contrary to it for any great length of time.

"When you reach home tonight you will probably go to bed and awaken in the morning asking yourselves: 'Was that stuff I heard last night some idealist's pipe dream, or has it some practical value?' To this I will answer that it is being done, and the overseers and superintendents in the mills which are working on this basis are proving weekly by their bank accounts the subject of my talk that 'Every Man Can Become His Own Efficiency Engineer.' "

What the Southern Mills are Doing

A distinctly original method of operating its mill or community store has been put into use by the Exposition Cotton Mills, at Atlanta, Ga. The plan has just been started, but was adopted after a careful survey on the part of the management to devise a method of operation that would work satisfactorily from all angles, and the present system seems to answer every requirement.

These mills have operated a store for a number of years, for providing a source of supply for the necessities of life for their operatives, without profit to the mills. In the past, it has been the custom to sell supplies at a price ten per cent below prevailing prices asked by commercially operated stores in the vicinity, but this, the mill officials felt, was neither practicable nor equitable, and they have devised the present system which offers numerous possibilities.

Under the method of operation now in force, the earnings of the store are ascertained at the end of the mill company's semi-annual fiscal periods, and a dividend on the net profits is paid to each mill operative whose name is on the store's books at the end of the period, on a percentage basis in proportion to the earnings of the store. That is, if a worker purchases $200 worth of supplies from the store during the fiscal period, and the store earns ten per cent net profits during the same period, this worker receives a dividend of $20 which is paid to him by the mill. The amount of dividends received by a worker is determined by the percentage of profit made by the store, and the amount of trading done by him and his family during the period. Thus, the operative with the larger family and the resultant larger account at the store, will receive a larger dividend in proportion.

One feature of the plan which will work toward the stabilization of the mill's working force is the fact that the operative's name must be on the store's books at the end of the fiscal period. That is, if a family stays at the mill for only a short while and leaves before the inventory, regardless of whether they have traded at the store to a large extent, no dividend is paid them, and the profits accruing from their trading is turned in to increase the dividends of those who remain.

The mill provides the store building to the store free of rent, so that the overhead is reduced to such items as insurance, stock, etc., and as a convenience to the operatives trading with the store, an order man is sent through the village each morning and deliveries made, and credit accounts are carried at the store. Another point in connection with the store is that the store has behind it the credit of the mill organization.

Thus, the operatives receive back every six months all the profits made on their purchases; the store stands any loss which may possibly occur; the operatives are relieved of the responsibility of store management; and the mill has an incentive to keep its workers with the plant—a splendid combination.

Plans for increasing the capacity of the plant about 15,000 spindles are being made by the Sycamore Mill, at Sycamore, Ala., and construction work will begin about May 1, it is stated.

The Alexander City (Ala.) Mills will also double the capacity of its plant by an addition of spindles about May 1.

The new 100 x 100 foot cloth room having been completed, the Merrimack Mfg. Co., Huntsville, Ala., are now constructing a warehouse, 75 x 100 feet, to cost about $20,000.

Lowe Manufacturing Company, Huntsville, Ala., is preparing for the erection of about 20 additional cottages in the mill village for the housing of additional operatives, and is also preparing for the erection of three warehouses for cotton and manufactured goods. The contemplated improvements at the mill and in the village will cost about $40,000, it is estimated.

Contract has been let by the Wellman Cotton Mill Company, at Athens, Ala., for the erection of ten cottages in the mill village, for additional operatives to be used on night shift work, and additional machinery will also be placed in the mill in the near future.

The mill at Roanoke, Ala., will be reorganized by the firm of Curran & Barry, New York, who have taken over the plant, and will continue it as the W. A. Handley Mfg. Co. The amount of $300,000 will be invested in improvements and extensions, it is stated, and the mill put on an operating basis. The mill for some time has been idle but the new owners propose to start operations as soon as possible.

Immediate improvements and extensions of the Berryton (Ga.) Cotton Mills and the Rome (Ga.) Hosiery Mills were announced recently by John M. Berry, president of the two organizations. The improvements at the Berryton Mills will consist of the addition of 3,000 spindles.

Thomaston Cotton Mills, Thomaston, Ga., recently let contract for the erection of 100 operatives' houses at a cost of more than $100,000. The houses will have electric lights, water, and other modern conveniences.

According to plans announced during the past month, the Bibb Manufacturing Company, with general offices at Macon, Ga., will make extensive mill village improvements at their Macon and Porterdale villages. This work will include the construction of 15 to 20 miles of concrete sidewalks, complete storm drainage systems for 7,800 houses, street improvements with curb and gutters, development of parks and playgrounds, school and hotel grounds, landscape planting, and other items of city improvements. Completion of the work is expected to take from 12 to 18 months.

An announcement of significance in connection with the industry in Georgia was that the Tallapoosa Mills, Tallapoosa, Ga., were purchased by William Whitman Company, of Boston. It is understood that the working force will be put on three 8-hour shifts, which, if effected, will be the first instance of this method of operation in this section. C. E. Pearce, who has been connected with the mills since their organization as superintendent, will continue in this position under the new ownership.

Plans are being made for the enlargement of the Star Thread Mills, Athens, Ga. New carding equipment is being installed, as well as warping and other machinery, which is the first of a series of improvements to be made at the plant.

Trio Manufacturing Company, Forsyth, Ga., has completed a large number of new houses for its employees. For several months the company has been on day-and-night operation.

Improvements representing an investment of $150,000,

will be made by the Dixie Mercerizing Company, Chattanooga, Tenn., which will practically double the capacity of its plant. This was announced following the annual meeting of stockholders held recently, at which all the officers were re-elected. Fred W. Lupton and T. Walter Fred were elected to the board of directors, succeeding J. P. Hoskins and Morrow Chamberlain, resigned. The present capacity of the plant is about 90,000 pounds of mercerized yarn a week, which will be doubled under the present plans.

In North Carolina, one of the month's events of interest was the organization of a new mill at Rockingham, to be known as the Leak Manufacturing Co., which will erect a mill and village and install approximately 15,000 to 20,000 spindles and between 400 and 500 looms in the plant erected. Robert & Company, of Atlanta, are the engineers. Among the principal incorporators are J. A. Leak, and W. P. Parsons, both of Wadesboro, N. C.; Wm. Entwistle, T. C. Leak and others of Rockingham, N. C. T. C. Leak is president. Construction work will begin about April 1.

Forty new dwellings will be built in conjunction with the new cordage mill of the Granite Falls (N. C.) Cordage Company, it is announced. This mill, nearing completion now, will be the largest cordage mill in the United States, it is claimed.

The Dixon Mills, Gastonia, N. C., will install about 4,000 additional spindles in their plant and will also erect a number of operatives' houses in the village, it is stated.

White-Parks Mills Co., Concord, N. C., have been organized and will erect a plant for the manufacture of hosiery yarn, with a daily capacity of 3,000 pounds of 8s to 14s. The building will be 101 x 51 feet, two stories, and an initial installation of 2,000 spindles will be made. Electric power will be used. R. C. Biberstein, of Charlotte, is engineer, and Whitin Machine Works, Whitinsville, Mass., will furnish the machinery, which will cost approximately $50,000, it is announced.

Plans for the new weaving mill at Cramerton N. C., call for an initial installation of 500 looms, with an ultimate installation of 2,000 looms. A dye house will be constructed. The weave shed is to be 125 x 600 feet, the slasher and warper shed 75 x 250 feet, two and three stories, and a boiler house containing two 250-hp. boilers, and to be 30 x 50 feet, will be added. Construction of sidewalks, sewer and water lines, is also planned, and a pumping equipment to insure a supply of about 300,000 gallons of water per 24 hours and filters to care for 500,000 gallons are also included in the plans. J. E. Sirrine & Co., of Greenville, are the engineers in charge.

Morehead Stack, Monroe, N. C., is promoting a movement for the organization of a fabric mill at that place for making automobile tire fabrics.

The Statesville (N. C.) Cotton Mills will add 17 cards and 1,100 spindles to their plant, bringing the total spindleage up to 14,000, it is announced. The cost of the improvements will be approximately $35,000.

Construction work on the Stowe Spinning Company and the Eagle Yarn Mills, Gastonia, N. C., which were organized three years ago, will be started this spring and summer. Both mills will manufacture fine yarns. The Stowe Spinning Company, which has an authorized capital stock of $1,000,000, will have 22,000 spindles, and the Eagle Yarn Mills, whose capital stock is $500,000, will have 10,000 spindles. S. H. Stowe is president and R. L. Stowe treasurer of the Stowe Company, and W. B. Puett is president and J. W. Stowe, treasurer, of the Eagle Mills.

J. L. Erwin, of Charlotte, N. C., has purchased the Providence Cotton Mills at Maiden, N. C., it was reported recently. The consideration is understood to have been around $79,000. Mr. Erwin is a brother of W. A. Erwin, of Durham, N. C.

The Dacotah Cotton Mills, Inc., Lexington, N. C., are working on the construction of a new office building, 50 x 38 feet.

Aberthaw Construction Company, of Boston, Mass., with offices in Atlanta under the direction of N. McL. Sage, southern manager, have been awarded the contract to move the plant of the Jenckes Spinning Company, of Pawtucket, R. I., to Gastonia, N. C., where the machinery will be located as an addition to the Loray Division of that company now operating in Gastonia. The New England machinery will come from the United States Division at Central Falls, it is reported, and this transfer is indicative of the trend of the industry toward the southern section, it is stated by Mr. Sage.

The Smitherman Mills, Troy, N. C., have purchased 160 Nordray 40-inch looms, 80 to be installed immediately and the remainder to equip a new weave shed which is now being constructed. Additional preparatory machinery will also be added to the plant.

The Newberry (S. C.) Cotton Mills have purchased 50 Nordray 40-inch sheeting looms to be installed immediately.

Crawford (Ga.) Cotton Mills, heretofore a spinning plant, will add weaving and have purchased 98 36-inch Nordray looms from the Hopedale Manufacturing Company. Canton flannels will be the product of the mills when this installation of weaving equipment is completed.

The Carolina Cooperative Council, which is the foremen's organization of the Carolina Cotton & Woolen Mills Company, met at Spray, N. C., on Tuesday night, February 13, for its regular monthly meeting. The council has been organized for three years and has held a very high attendance record all the time. It meets monthly and hears inspirational talks, looks over and discusses production and personnel reports, and enjoys a social hour.

Last fall the program committee of the council decided that it would start technical discussions at these meetings, and on December 14th, the first technical discussion, covering carding and spinning, was spirited and greatly enjoyed. It is interesting to note that these 200 members of the Council, representing twelve different plants, manufacturing a variety of fabrics, are a small "sectional meeting" in themselves.

At the meeting on February 13th, the second technical discussion was held, covering weaving. There was a scarcity of time owing to the fact that the meeting was held in the evening, and furthermore a picture secured from the Drake Corporation, of Norfolk, Va., was shown. This picture showed correct and incorrect practices in cotton mill processes, and proved very informing and interesting.

Following the preliminary business and the picture, L. W. Clark, chairman of the council, called on T. A. Caston, superintendent of the Draper plants, to make a short talk on weaving and introduced several points for discussion. Mr. Caston has charge of 498 sheeting looms and 480 blanket looms. He made a very interesting talk, covering many weave room problems and conditions. In the first

COMINS IMPROVED ATOMIZER

The most efficient device of its kind. Air and water openings separate. Both can be cleaned instantly by a pull on the lever operating the cleaning wires.

"WHY am I so set on having that particular company install our humidifying system?" the president repeated the director's question thoughtfully. "Well, that company was the pioneer in scientific humidification and it has the most successful installations to its credit. It's been in the business since 1888 and the absolute reliability of all its devices is a by-word."

("That company" was the American Moistening Company.)

IN the files of The American Moistening Company are hundreds of letters bearing witness to the unquestioned reliability and efficiency of its installations.

Why? Because industrial humidification is a science. Because exact scientific knowledge and long practical experience are indispensable to the planning and installation of any humidifying system that's to be 100% reliable and efficient. And because American Moistening Company delivers to its clients an experience as old as scientific, industrial humidification.

Ten humidifying systems and devices are now utilized by American Moistening Company. They represent the last word in sound scientific operating principles—the utmost in structural perfection. Their reliability has been demonstrated in all types of mills—under all conditions of climate—North and South, inland and on the seaboard. Our engineers can tell you in detail exactly what systems and devices your mill requires. A letter will bring one of these experienced men to your offices.

AMERICAN MOISTENING COMPANY

Sales Offices:
251 Causeway St., Boston, Mass.

Since 1888 reliable humidifying devices.

place, he made a plea for understanding and cooperation in all of these problems that come up. He made the definite point that all mistakes and troubles center in the weave room, finally, and that each department, from the machine shop through the mill, must exercise all care in the preliminary processes so that the weave room can work to the best advantage. "We are all working for production and quality production," he said, "and we must get together. All the problems are our own and must be shouldered together."

Some of the things, said Mr. Caston, that give trouble in the weave room, are imperfect and uneven yarn caused by mistakes all the way back through the opening and picker rooms; hard filling and thin places caused by faulty piecing up; kinky warp threads caused by the spoolers; wrong shades and uneven shades caused at the dyehouse; greasy, gouty yarn; bad shuttles, bad reeds, and improper humidity. "There are many other things that cause trouble," he continued, "but these are just a few that stand out. There are also certain general things we must have in mind to do before the weaver gets the best results. We must have good raw material, plenty of good supplies and work our help in the best manner possible. In our differences and discussions we must recognize our faults along with the other fellow's."

The informal discussion was taken up at this point, but due to the lateness of the hour, it was necessary to curtail this feature of the program. However, a number of interesting remarks were developed in this discussion with especial regard to oiling and cleaning. Mr. Caston suggested the discussion of sizing and slashing, oiling and cleaning looms and setting harness, and replying to a question in connection with sizing and slashing, said, "We must get the proper mixture of size on the warp and get the proper temperature and we must have slasher tenders who know their jobs or the weavers will have great trouble later on." He pointed out that no definite or particular formula or plan could be laid down for all mills, as each plant and room has its own conditions and problems in which judgment must be exercised according to the local situation.

A member asked for some discussion on weave room oiling, and Mr. Arwood, replying to a question as to how he has his oiling taken care of, replied that he uses "a trained man on that job."

"Do you mean to say you have a technical graduate to do your oiling?" asked Mr. Clark, jokingly. "This particular 'graduate,' " replied Mr. Arwood, "happened to come from the mountains of Virginia." "That's where most of ours come from," commented a member. Mr. Coward, responding to a question, stated he has one man responsible for the oiling, as he has found that to be the most economical plan.

Taking up the question of cleaning, opinion expressed was opposed to compressed air for cleaning looms. One man stated it is a bad practice and will ruin the warps, and Mr. Lamar said, "We use homespun brushes for cleaning our looms. We have flaps, also, which are home-made." Another member added that he had secured good results by the use of a suction system. This was Mr. Lamar. Mr. Coward said he had tried compressed air in his room several years ago, but that "it wasn't satisfactory," and that as a general proposition he would not favor the air cleaning process. It was necessary at this point to bring the discussion to a close, "just as it is getting interesting," said the chairman, "but we will postpone further discussion, especially that on finishing, until a later meeting."

Contract for the construction of 50 houses for operatives has been let by the Tucapau Mills and the Jackson Mill No. 2 at Wellford, S. C., at a cost approximating $50,000. Forty houses will be erected in the Tucapau village and ten at the other mill. New machinery was added to the Tucapau mill sometime ago and the addition of forty houses is to provide housing facilities for the additional operatives made necessary by the enlargement. The Jackson Mill No. 2 was bought several months ago from the Fort Prince Spinning Mill company, and was enlarged from 4,000 to 12,000 spindles shortly after its purchase. Alfred Moore is manager of both mills.

Piedmont (S. C.) Mnufacturing Company has just completed an addition which enlarges the bottom floor of Mill No. 4, making room for about 20 more looms to be installed shortly. With the installation of these looms, the mill will have a total of 2,012 looms.

Eight new cottages are being built in the Kershaw (S. C.) Mill village.

Gaffney (S. C.) Mfg. Company is installing 45 new toilets, including all accessories, and a number of drinking fountains, etc.

The Calhoun Mills, Calhoun, S. C., are moving along nicely with their building operations. They expect to have a good part of the additional 15,000 spindles and 400 looms in operation by the 1st of May.

Building permit has been issued to the Beaumont Mill, Spartanburg, S. C., for the construction of a weave shed, to cost about $75,000, and 50 four-room cottages for employees, costing $75,000.

A two-story brick extension of the machine shop building is being erected at the F. W. Poe Mfg. Co., Greenville, S. C., at a cost of approximately $10,000.

From Texas come a number of reports of progress in the development of the industry in that section. The Tyler (Texas) Chamber of Commerce has received a proposition from Philadelphia interests offering to construct a mill to cost around $400,000. At Beaumont, Texas, W. K. Parker, representing the Planters & Merchants Cotton Mills of San Antonio, is interested in the erection of a $700,000 plant in that section. The mill of this company at New Braunfels, Texas, is nearing completion with 10,000 spindles and 350 looms, driven by electric power from hydro-electric development. W. A. Spencer, secretary of the Temple (Texas) Chamber of Commerce, is interested in the organization of a company with $200,000 capital to build a 10,000-spindle yarn mill.

The 1923 edition of the Textile Manufacturer Year Book is being distributed. In this, the fifth issue of this well known English reference book, several new features are introduced in addition to the regular departments contained in previous editions. A new section on cotton yarn doubling, giving a clear, succinct account of doubling practice, and other interesting material has been added. The new features have added 32 pages, giving a total in this edition of over 540 pages. This publication is issued primarily to provide a handy collection of notes, rules, tables and data relating to textiles and textile practices, a special endeavor being made to include matters not readily accessible from other sources. It is published by Emmott & Co., Ltd., 65 King St., Manchester, England.

Barrett Specification Roofs

Bonded for 20 and 10 Years

All Over the U.S.A.—

Pictured on this page you see the principal new buildings in eight representative American cities.

All kinds of buildings are included among them—libraries, schools, hospitals, banks, office buildings, stores, hotels, railroad stations, warehouses, factories. All kinds of materials were used in their construction—stone, brick, terra cotta, concrete.

Yet every one of these buildings has the same roof—a Barrett Specification Roof.

For leading architects and engineers all over the United States know from experience that the Barrett Specification Roof represents the utmost in roof economy—lowest cost *per year of service.*

The eight cities shown are typical of all progressive American cities. No matter where you go you will find that a large majority of the permanent flat-roof buildings—whether they are industrial, commercial, or public buildings—are covered with Barrett Specification Roofs.

Bonded Against Upkeep Expense

Without cost to the owners, Barrett Specification Roofs are bonded by the U. S. Fidelity & Guaranty Company against repair or maintenance expense; Type "AA" Roof for 20 years, and Type "A" Roof for 10 years. We will gladly send, on request to our nearest office, full information regarding these bonded roofs and copies of the Barrett Specifications.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh Detroit New Orleans Birmingham Kansas City Minneapolis Dallas Salt Lake City Atlanta Bangor Youngstown Toledo Columbus Richmond Baltimore Omaha Houston Denver

THE BARRETT COMPANY, Limited:
Montreal Toronto Winnipeg Vancouver St. John, N.B. Halifax, N.S.

The New England Mill Situation.

Production in the New England mills continues at capacity levels which does not mean to the full limit of installed equipment. There is still some machinery idle owing to the difficulty of procuring operatives who care to accept the work offered, or in a few instances to the unwillingness of managers to operate on unprofitable work. There is considerable overtime work being done in some places.

Southern competition is occupying a large share of manufacturing and popular attention. Legislatures are in session and where efforts are not underway to reduce working hours to 48 weekly, as in New Hampshire, there are movements afoot to restore the 54 hour week, as in Massachusetts. In Rhode Island the strongest kind of a contest is on to bring about the enactment of short hour legislation, but in this case the business men and manufacturers as a whole are very well united in opposing it.

In New Hampshire the lower branch of the legislature passed a 48-hour bill with a large majority showing in the results. The bill has still to be passed on by the Senate and it is believed now that it will be blocked there owing to the opposition of manufacturers aided by farmers and their representatives.

Southern competition enters into the matter because it is constantly being referred to by unionists and by manufacturers. The latter regard it as menacing to the life of New England industry, while the unionists persist that southern competition is being greatly exaggerated as a factor in the questions at issue. Manufacturers point to the large investments going into the South backed by northern mills as well as by some of the best known holders of New England mill stock. Very recently it is stated, the Everett mills of Lawrence, decided to seek the establishment of a southern branch of their plant.

Whatever may be the merits of the claims set up in this section concerning southern competition, the fact that is apparent is that while nearly a million new cotton spindles will be added in the South as a result of plans already formulated or underway, no new plants and no very substantial additions are being contemplated in New England.

When the legislative contests are ended, cotton manufacturers expect that they will be confronted with demands for a restoration of the wages cut off two years ago. Already, the mill firemen and the doffers at Fall River have formulated their requests and presented them to manufacturers, receiving negative answers in each instance. Conferences with other operatives are being held in that city but no decision has been arrived at concerning future action, the matter being now in the hands of the unions.

Threats have been made at Lawrence, Mass., and in Manchester, N. H., that demands will be presented shortly for more wages in those centers. In the meantime, while the cotton goods markets seem strong enough, it is definitely stated by selling agents for mills that further advances in cloths will not be paid by the buyers, whether the advances are forced by higher wages or other causes. The market disposition now is to refrain as far as possible from further price uplifts lest anothers buyers' strike is seen in consuming channels.

Owing to the great demand for fancy fabrics there is a greater call for skilled weavers than the labor market affords. And it is not easy for mills to secure any surplus skilled help in other departments. The lack of new emigration is felt and there is also a left-over feeling of resistance to whole-hearted work, following the strikes of last year. Manufacturers are well content when they can keep a fair proportion of machinery active on work the operatives will accept. They are not taking any more difficult work that they can help.

There is considerable work being done in many plants toward effecting further economies in operation, notably in the direction of electrifying machinery, putting in oil burners instead of coal, and in other ways trying to make the most of the present equipment. There are certain operatives in the larger centers quite content to work a few hours overtime in departments and in Massachusetts it is permitted to run overtime if women and children are not employed. It has also become possible, because of electrical equipment to operate single departments or sections advantageously, where the use of steam engine power is not needed.

During the past month, while manufacturers in this section have not become any less conservative, they have been disposed to look ahead a couple of months further than they would at the opening of the year. At that time they had many doubts of the selling power of cotton goods based on 25c raw material. They have since been receiving many orders carrying well into April, while the mills making fall cottons have done a very good business on deliveries carrying into August.

There has been a distinct improvement in the demand for bleached cottons of the 4-4 types, and there has also been a larger business booked on percales and other printed staples and semi-staples. The job printers and finishers are not running to capacity in all instances but they are finding orders improving as the spring and summer retailing periods approach. The recent craze for novelties in printed effects has led to a rush of demand for anything in oriental or Egyptian printings and almost any sort of cloth is wanted if the colorings or printings are of modish design. The general staple wash goods business on printed lawns, batistes, and similar fabrics has been lighter than usual as buyers have preferred to operate in a hand to mouth way. Now that fancies and novelties have come in so strong it is believed that the demands will grow much stronger.

It has doubtless been noted by COTTON's readers who follow the market reports of new openings, that New England mills have made a great stride toward diversifying the character of their lines. The new Amoskeag lines of fancy cottons were styled much more ornately than ever before, and many new colorings were introduced. The lines of branded ginghams made by the Boston, Parkhill, and Lancaster mills included many artistic designs not hitherto attempted in what are termed dress ginghams. While the box loom effect is maintained, many fine corded, ratine, and striped effects were introduced and offered to buyers under the regular tickets.

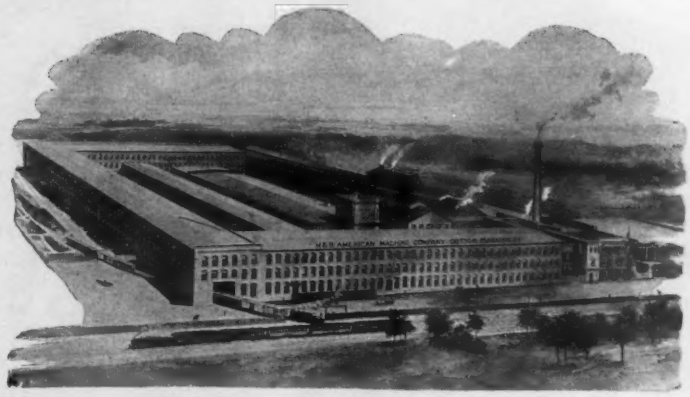
It has been shown that the domestic market is quite ready to take a larger volume than ever before of fine and fancy cottons when qualities are maintained. By offering goods of this character under their old established tickets

H & B AMERICAN MACHINE CO.

PAWTUCKET, R. I.

COTTON MACHINERY

Crighton Openers
Buckley Openers
Roving Waste Openers
Hopper Bale Openers
Feeders
Self-Feeding Openers
Breaker, Intermediate
and Finisher Lappers
Revolving Flat Cards



Drawing Frames
Slubbing Frames
Intermediate Frames
Roving Frames
Spinning Frames
and Twisters
Spindles and Flyers
Spinning Rings
Fluted Rollers

Southern Office:
814-815 Atlanta Trust Co. Building
ATLANTA, GEORGIA

some of the well known New England mills have jumped into a much stronger place in the markets. The Pacific Mills has greatly amplified and diversified its line of Serpentine crepe, an old established crinkled fabric. Many modish plain shades have supplemented the always highly styled printed designs. The Merrimack company of Lowell has brought out a new light weight corduroy called Merricord, suitable for kimono and dress wear, thus getting away from the ordinary velveteen and corduroy. In bringing out its new lines of Pamico cloth, a suiting effect, the Pacific has added complete color ranges in harmony with the most advanced color cards in vogue, and this well made two ply fabric occupies a new place in the trade.

Such mills as the Pepperell and the Androscoggin have been bringing out new cloths and the cutting trades look to them for the higher qualities. In Rhode Island the B. B. & R. Knight mills are being turned on to fine carded or combed yarn goods, thus getting away somewhat from the intense southern competition on the staples.

In New Bedford, the fine goods mills are using larger quantities of silk and artificial silk each month to meet the demand for the higher priced and fancier lines. In Fall River, it is a rare experience to find a mill working regularly on staple goods. They are employed on narrow odds in count, weight, and widths, and there appears to be a broadening market for specialties of this sort. While a larger part of the output still goes into print-works or bleacheries, many of the goods go into strictly specialty purposes. Millions of yards go into finer bag manufacture, to plant coverings, to hospital supply concerns, or to special purposes in connection with lining or auto work.

The financial reports of the past quarter have proved moderately satisfactory but it is evident that days of harder competition are at hand. The mills that have increased their capital are finding it difficult to maintain an average dividend on the total issue despite any gains that may come from a revision of taxation.

The courts have many protested tax cases in hand, dealing chiefly with local valuations and assessments. Comparisons made with taxes in small southern communities, naturally make New England manufacturers envious, although a comparison of tax bills does not always form a sound comparative basis. Many southern mills are called on to maintain schools, houses, or stores, while the New England mills have advanced beyond that stage of paternalism in dealing with their workers.

It is interesting, in view of the idle talk of southern competition and the unionists claims of hard work in mills, to recall an instance of long and steady employment in a bedspread mill at Housatonic, Mass. Five people were recently pensioned by a cotton mill plant there and their combined service in the mill totalled 247 years. Three of the five worked over 50 years in one cotton mill plant. This is one of the sidelights showing that work in New England mills has not been as hard as some pens have painted it.

"The man who decides to hold off until things improve may find when things improve that the man who held on and helped them to improve is so far ahead he can't be caught."

Cotton Comment.

BY H. & B. BEER.

New Orleans, February 16th, 1923.

Since our review of one month ago, the market, after advancing to the highest level of the season, reacted sharply temporarily under the influence of extensive liquidation due to the uncertainty of the political situation in southeastern Europe, but values recovered subsequently owing to the belief that war will be averted in Europe and because of the growing bullishness of the statistical position of the staple, spot values now ruling again at the highest levels reached so far this season, and prospects are that they are due to go higher, perhaps much higher eventually.

Contributing to the recent depression in the market was the breaking of the drouth in Oklahoma and Texas by general copious rains during January, which provided the needed reserve of subsoil moisture to permit the completion of plowing and germination of seed when it is planted. The attending low temperatures were looked upon as the means whereby much insect life would be destroyed, perhaps exterminating weevil to a large extent.

Anent the late cold wave in the cotton region and its probable effect on the weevil, many people were under the impression that the low temperatures would kill the pest, but according to C. W. Watson, of the Farm Development Bureau, Memphis, a temperature of 16 degrees, such as was experienced in the Memphis district, was not sufficiently cold to freeze out the boll weevil. To be effective against the weevil, a temperature of 6 to 8 degrees over a period of several days is necessary.

Tending to revive confidence in the probability of higher prices ultimately, returns to the Census Bureau showed that American mills consumed 611,000 bales of lint cotton during January vs. only 527,000 for the corresponding month of last year, with active spindles in the United States at the close of January numbering 35,241,000 vs. 34,441,000 one year ago, indicating that domestic consumption will continue heavy.

During the first six months of the season mills in the United States consumed 3,610,000 bales, including 337,000 bales of linters, against 3,341,000 bales for the corresponding time last season, including 329,000 bales of linters.

On the present basis of consumption American mills are consuming on the basis of 7,220,000 bales for the whole season, of which about 300,000 will be foreign cotton. The previous record season's consumption including foreign cotton by American mills, exclusive of linters, was 6,789,000 in season of 1916-17.

THE POSITION OF COTTON IN A NUTSHELL.

American Cotton	This year	Last year
Remaining to be marketed	2,612,000	4,754,000
World's visible supply	2,811,000	3,843,000
World's available, ex. mill stocks	5,423,000	8,597,000

In order that our friends may have a keener insight as to the present status of the cotton situation on this side of the Atlantic, we give below careful and conservative deductions compared with the situation at this time last season:

United States	This season	Last season
Stocks at counted interior towns Aug. 1st	312,000	977,000
Stocks at uncounted towns Aug. 1st	964,000	3,713,000
Stocks at U. S. ports Aug. 1st	450,000	1,335,000
Crop, estimated	9,750,000	7,978,000
Linters, estimated	450,000	429,000
Season's supply	11,926,000	14,432,000
American mill takings for season, if	6,500,000	6,545,000
Exports from U. S. for season, if..	5,426,000	6,121,000
American mill takings & exports, if	11,926,000	12,666,000
Total available, ex. mill stocks....	11,926,000	14,432,000
Possible carry-over, ex. mill stocks	none	1,766,000

While the allowance for American mill takings for the season are placed at 6,500,000, at present they are running on a basis of about 6,656,000, and while the allowance for the season's exports is set at 5,426,000, at the moment they are running on a basis of about 5,896,000.

Unless exports or spinners takings fall off sharply compared with after this time last year, America will be drained of its raw cotton by the close of next July.

In view of the probability of stocks in the United States being reduced to the minimum by next summer, there is all the more the need for the making of a large crop this year for next season's requirements and to replenish depleted stocks. The question is can a large crop be made this year?

Conference for Control of Boll Weevil.

On February 20 and 21 a conference was held in Atlanta, Ga., to promulgate a campaign for the control of the enemy of the southern farmer, the boll weevil. Full sessions during the two days included prominent speakers in the textile industry and other fields, and this gathering marked the first concerted step toward the eradictaion or control of the weevil. Practically every phase of the industry affected by the weevil's depredations was represented.

C. E. Hutchison, president of the American Yarn & Processing Company, Mt. Holly, N. C., and president of the American Cotton Manufacturers' Association, was one of the principal speakers of the conference. Mr. Hutchinson spoke on Wednesday afternoon, presenting to the conference the viewpoint of the cotton manufacturer regarding the plans of the organization. Other speakers of national prominence were included in the program.

Following the conference, a permanent organization was formed—the National Campaign for Boll Weevil Control—which will operate with Dr. Miller Reese Hutchinson, well known scientist, as managing director, and it is planned to conduct extensive experiments with various methods devised for the purpose of controlling the weevil, and if possible, make recommendations upon the findings as to the method most effective. Plans are being made for the raising of a fund of $2,500,000 for carrying on this work. Further developments of the organization's work will be awaited with interest, as this conference marked the beginning of the first concerted action of all allied interests in the control of the weevil.

Ask For It

Here's an interesting and beautifully illustrated booklet that the busiest mill executive will find worth the few minutes time it takes to look it over, and it may mean many dollars saved. It tells about

A New Idea in Heating and Ventilating

Modern industry knows that ventilation is worth every cent put into it, but many have not stopped to consider that it costs as much to ventilate a room as it does to heat it—one-half the coal bill being heating cost and the other half ventilating cost. This new tried and proven system not only reduces both costs to the minimum but insures more perfect heating and ventilation.

Tell your stenographer to drop us a line
todsy asking for this worth-while booklet.

BUCKEYE BLOWER COMPANY, COLUMBUS, O.

Southern District Office: 372 Whitehall St., Atlanta, Ga.

324 Monadnock Block, Chicago, Ill. 1400 Broadway, New York, N. Y.
501 Wabash Bldg., Pittsburgh, Pa.

Notes About Men You Know.

PAUL A. REDMOND, who for a number of years has been the agent of the Aragon Mills, Aragon, Ga., and treasurer of the Brookford Mills, at Brookford, N. C., and who has recently been assigned the position of general manager of three of his company's largest plants. Mr. Redmond will in the future make his home and headquarters in New York, it is understood, although his duties will bring him South for a good part of the time. He is recognized as one of the efficient and popular operating executives in this section. At the time of his leaving Aragon, he held also the position of county commissioner, in which his practical and constructive work was of the highest type.

W. D. MCCOMBS has resigned as superintendent of the mill of the Bowen-Crews Company, Athens, Ga.

MACK BROOKS has been made overseer of carding at the Lawrenceville (Ga.) Mills.

PAUL A. READ, superintendent of the Richard Borden Mfg. Co., Fall River, Mass., has resigned to accept the position of agent and buyer at the Massachusetts Cotton Mills, Lowell, Mass. Mr. Read will succeed William A. Mitchell, whose appointment as vice-president and managing director of the Universal Textile Corporation, with headquarters at Shanghai, China, was announced last month. Mr. Read is a native of Manchester, N. H., and a graduate of the Lowell Textile School. After graduation he was employed for four years by the Massachusetts Cotton Mills, going to Fall River several years ago to take the superintendency of the Barnard Mills. Later he was superintendent of the Seaconnet Mills for five years, and had been with the Richard Borden Company for ten years up to his resignation to accept the Lowell position. He was one of the youngest mill superintendents in Fall River.

ERNEST GUEST has been appointed overseer of spinning at Hamilton-Carhartt Mills, at Elberton, Ga., succeeding Clayton Sorrells.

C. H. BOYD has resigned as general superintendent of the Lumberton, Dresden and Jennings Cotton Mills, at Lumberton, N. C., after seven years experience in this position. He has not indicated his future plans.

P. B. MITCHELL, who has been overseer of weaving at the Eureka Cotton Mills, Chester, S. C., has become night superintendent with the Osage Manufacturing Company, at Bessemer City, N. C.

JESSE HOARD, who has been overseer of weaving at the Baldwin Cotton Mill, Chester, has succeeded Mr. Mitchell at the Eureka Mills.

H. B. MILLER, formerly superintendent of the Ashcraft Mills at Florence, Ala., has become overseer of carding at the Swift Manufacturing Company, Columbus, Ga.

GEORGE ALBERT DRAPER, the treasurer of the Draper Corporation, Hopedale, Mass., died at Phillips House, Massachusetts General Hospital, February 7, 1923. Mr. Draper, who was the son of George and Hannah B. Thwing Draper, was born in Hopedale, Mass., on November 4, 1855. He was educated in the local schools, the Allen School of Newton, and the Massachusetts Institute of Technology. On November 6, 1890, he was married to Miss Jessie Preston, daughter of General William and Margaret Preston of Lexington, Ky.

On leaving school, he entered the office of George Draper & Son, a copartnership comprising his father and oldest brother; he was made a member of the firm in 1877, and the title of the firm changed to George Draper & Sons. He was treasurer of the Hopedale Machine Company and Hopedale Machine Screw Company at the time of the consolidation of the various manufacturing interests in Hopedale in December, 1896, and was at that time elected treasurer of the Draper Company. He was chosen treasurer of the Draper Corporation when it succeeded the Draper Company in 1916.

Mr. Draper was the head of the financial and manufacturing departments of Draper Company and Draper Corporation from his election in 1896 up to the time of his death. In the development and introduction of the Northrop loom, he was an important factor; and to his vision, business ability and persistence is due much of the progress in the art of weaving during the past 30 years.

At the time of his death, Mr. Draper was treasurer of the Draper Corporation and the Northrop Loom Company; President of the Grafton & Upton Railroad Company, and the Harmony Mills, Cohoes, N. Y.; director of the First National Bank of Boston; the Manville Company, Providence, R. I.; the Calhoun Mills, Calhoun Falls, S. C., and the Brogon Mills, Anderson, S. C. He was a member and ex-president of the Home Market Club of Boston.

Mr. Draper leaves two children, Major Wickliffe Preston Draper, and Mrs. Helen Draper Taft. His wife, Mrs. Jessie Preston Draper, died February 11, 1917.

The funeral services were held at the Unitarian Church in Hopedale on Saturday afternoon, February 10, at three o'clock, following a brief service at the house in Boston, and the works of the Draper Corporation were closed on the day of the funeral, and the employees credited with their usual pay.

Mr. Draper made his home in Hopedale and was much interested in the town and its people. The Unitarian Church, which was dedicated in 1898, was given to the Unitarian Parish, of which they were members, by George A. and Governor Eben S. Draper as a memorial to their father and mother—George and Hannah B. Draper.

About two years ago with a view to providing accommodations for various activities, Mr. George A. Draper arranged for the incorporation of the Hopedale Community House, Inc., and furnished the funds for a community building and its equipment, and an additional fund, the interest of which will furnish an annual income. The community house will be completed ready for occupancy within a few months.

TOLHURST

Reg. U. S. Pat. Off.

EXTRACTORS

IN THE TEXTILE INDUSTRY SINCE 1878

A List of Users of Tolhurst Extractors would comprise a Directory of the Industry

Since 1878, Tolhurst Machine Works have specialized in the construction of hydro-extractors. Tolhursts are recognized as standard by the industry. The first Self-Balancing Extractor was designed and built by Tolhurst. Other types have been evolved from time to time to fit the varying reqtirements of the manufacturer.

Tolhurst Extractors are especially noted for their smooth running, long life, and low upkeep cost. These outstanding features have been demonstrated by actual performance time after time during the past forty-five years.

Tolhurst Extractors are made in several types and sizes. Their basket capacity is unequalled by other extractors of corresponding size.

Established 1852

TOLHURST MACHINE WORKS, TROY, N. Y.

New York Office 111 Broadway

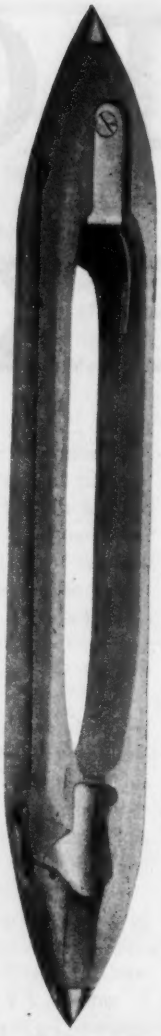
Western Representative:
John S. Gage,
8 So. Dearborn St.,
Chicago, Ill.

Southern Representative:
Fred H. White,
Realty Bldg.,
Charlotte, N. C.

San Francisco Representative:
B. M. Pilhashy,
Merchants Exchange Bldg.,
San Francisco, Cal.

Canadian Representative:
W. J. Westaway Co.,
Westaway Bldg., Hamilton, Ont.
400 McGill Bldg., Montreal, P. Q.

ECONOMY



THE savings made by the U S B & S Co. Products are a real economy—not only because the immense organization with eight big factories has such vast resources and buying power that higher class products can be produced at a lower cost, but because U S B & S Co. Products are designed by the most expert and experienced textile engineers to give more perfect satisfaction and longer life. Every product bearing the name U S B & S Co. must live up to the enviable reputation established years ago.

U S Bobbins are stronger, lighter and absolutely smooth and true. A system of testing every bobbin on your own spindles eliminates any that do not run true.

"Stetson" Hand Threading Shuttles are the best hand threading shuttles ever put on the market.

"S EYE Automatic Shuttles" have proved to the most skeptical that they are the most remarkable automatic shuttles ever made for any kind of automatic loom. Their simplicity, ease in positive threading, uniform tension and freedom from unthreading, misthreads, mispicks and broken picks are sufficient reasons why automatic loom users are demanding them.

U S Shuttles are made in every type for Draper, Stafford and C. & K. Looms. Other U S B & S Co. Products include the following:

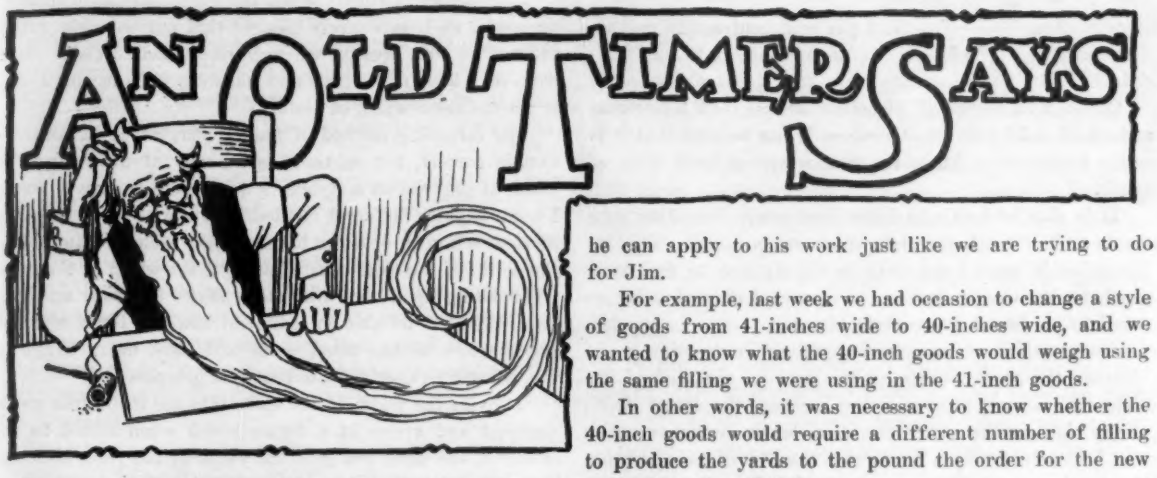
BEAMS	SPOOLS	BOBBINS	ROLLS
Cotton	Moquette	SPEEDERS	Comber
Rubber	Drawing	WARP FILLING	Underclearer
BOBBINS	Warper	CAP FILLING	Drawing
SHUTTLES	Twister	FLAX SPINNING	Winder
SKEWERS	Jack	TWISTERS	ETC.
	Silk	TRIPTODS	
	Belting	QUILLS	

Ask today for Catalog.

U S BOBBIN & SHUTTLE Co.

LARGEST BOBBIN and SHUTTLE MANUFACTURERS in the WORLD

Eight Factories **Providence R.I.**



Guess you remember my friend Jim that I told you about visiting last month.

Well, bless my soul, if old Jim hasn't waked up! He wrote me a letter as long as the Declaration of Independence, and what do you suppose he has got into his head? Well, sir, he says he is going to be a superintendent or *bust!*

And that's all right, too. I admire his spunk, but the thing that amused me most was that he asked me to write him at once and tell him how to do *all* the weave room calculations he would need.

Darn! Some job! But of course Jim did not know any better. He has been living in a card room now for pretty close to forty years.

He had the nerve to tell me that he read that "Old Timer" article I wrote some time ago about a man "never getting too old," etc., and knew I was hitting at him, so he would put it up to me to help him out on the weave room stuff.

Now just to tell the truth, "Old Timer" isn't very long on that technical calculation dope since the magazines are so full of writings by these young overseers and superintendents who are textile graduates.

You know several years back when we wanted to impress a person with a very fine or close setting, we would say that was like "splitting a hair." Well, some of these young fellows can take that hair after we old-timers split it and then split it about a dozen times more. Gosh! I just get dizzy and my faithful old corn cob goes smack out when I read some of the fine technical articles in COTTON.

But we've got to help Jim out somehow, and I told him that I would write to COTTON about it and that maybe some of you fellows would help out too. But remember now, if you do agree to help my friend out, he is no spring chicken, won't see fifty many more times, and a little thick-headed—but one of the finest carders I ever saw take hold of a card gauge. So what you say to him about weaving, say it a little easy, so to speak, cut out the high-faluting stuff and just talk plain United States so Jim can understand it.

Here goes mine:

Sometimes the simple little calculations which come up from time to time may not only be of some interest to my friend Jim, but to other overseers who have occasion to use similar calculations, and if we send them to COTTON it may be that some overseer will get an idea by reading them that he can apply to his work just like we are trying to do for Jim.

For example, last week we had occasion to change a style of goods from 41-inches wide to 40-inches wide, and we wanted to know what the 40-inch goods would weigh using the same filling we were using in the 41-inch goods.

In other words, it was necessary to know whether the 40-inch goods would require a different number of filling to produce the yards to the pound the order for the new style of goods called for.

Example:

72 x 80 41-inch goods weighs 4.10 yards to the pound.

What will 72 x 80 40-inch goods weigh using the same filling?

7,000 grains = 1 pound ÷ 4.10-yard goods = 1,707 grains which is the weight of one yard of goods. $72 \times 8\frac{1}{3}$ divided by 30s warp with 15 per cent added for size and contraction or 30s × 85 per cent = 25s, therefore

$$\frac{72 \times 8\frac{1}{3}}{25} = 24 \text{ grains or weight of one yard of 72 threads.}$$

($8\frac{1}{3}$ is the grains in one yard of 1s yarn, obtained by dividing 7,000 grains by 840 yards.) 1,707 grains minus 24 grains = 1,683 grains = the weight of one yard of the goods 40 inches wide. 7,000 grains in one pound ÷ 1,683 = 4.159 yards to a pound of 40-inch goods.

One very necessary thing to know is what the warp is contracting in weaving and the approximate weight being added in starch and water. All overseers of weaving and superintendents should know that exact contraction of every style of goods they are making. This is not only necessary for practically all calculations, but gives a record from which they can judge the contraction of a style of goods they have *never* made. If you were making 80 x 80 goods and had never made 72 x 80 goods, you would know that the warp contraction would be practically the same. At least near enough to make a fairly accurate calculation.

One good way to ascertain just what each style of goods is contracting or taking up in the process of weaving is to break out an end at the cut mark on the slasher and, while the slasher is running, wind it onto a 12-inch or 6-inch piece of card board until the next cut mark comes up, then count the threads which are all 12 or 6 inches long and see how many yards per cut there is at the slasher.

A better method is to get the yarn reel from the spinning room and measure the yarn. When using the yarn reel it will be advisable to break out two or three threads to wind onto the reel if 30s yarn or lighter is being reeled, because one thread would be very easily broken.

After finding out the length of cuts on the slasher, go to the cloth room and examine several cuts which have both cut marks on them and the exact length of the woven cuts may be ascertained.

Example: If the slasher cut is 66.5 yards and the woven cut is 61, there is 66.5 — 61 = 5.5 yards contraction of

take-up, then $\frac{5.5 \times 100}{66.5} = 8$ per cent contraction on this style.

On 68 x 72 there will of course be less than 8 per cent and on 56 x 52 still less, therefore it can be seen that it is really necessary to know the contraction of each style of goods.

It is also advisable to know how much the filling contracts or how much the cloth contracts in width. This information is needed not only in calculations to find yarn numbers, but also in finding the correct dent reed to be ordered to produce a given style of goods.

One method of ascertaining filling contraction is to measure the actual width of the yarn in the reed at the loom with a steel tape and then measure the actual width of the cloth on the roll at the loom, being careful to notice that both selvages have the correct numbers of ends and that the tension in the loom is correct to give a good smooth face to the cloth.

It is possible for the speed of the loom to affect the width of the cloth. I once worked in a mill where the weaving ran 30 minutes after the carding and spinning stopped, and the speed would always go up when this power came off. We had complaints about the cloth being uneven and finally discovered that the cloth made after the carding and spinning stopped was always wider than that made during the regular day's run.

This was several years ago, and let-off motions have been greatly improved since then, and the goods being woven were not print cloths but considerably heavier, which made the varying speed of the loom have more effect on the width than if the goods had been made of finer yarns.

After measuring the width of yarn at the reed and then the width of cloth on the roll, the percentage of contraction can be easily got in this way. 80 x 80 probably measures 41⅜ inches wide at the reed and 39⅛ inches wide on the roll of cloth; then 41⅜ — 39⅛ = 2 2/8 or 2¼ inches contraction. Now (2.25 × 100) ÷ 41.375 inches = 5.43 per cent.

To reduce the ⅜-inch to a decimal it is only necessary to divide the top figure (numerator) by the bottom figure (denominator) thus 3 ÷ 8 = .375 and ¼ the same way = .25. This gives us 41.375 width at reed into 2.25 inches contraction. It is always necessary to multiply the dividend by 100 when calculating for percentage.

When making very low count goods it will be advisable to measure the cloth after it has been folded instead of on the roll at the loom, because such goods are sometimes less in width in the fold than on the roll of cloth as it comes from the loom. 56 x 52 40-inch 6.15 yard goods and 48 x 48 38½-inch 7.15 yard goods are examples of constructions which generally are not as wide after being folded as they are on the roll of cloth at the loom.

Most looms built for making plain sheetings are now equipped with what we call high take-up rolls. That is, the take-up roll or sand roll is placed very near to where the old breast beam formerly was, and the cloth passes directly to the sand roll, then the iron cloth roll on which the cloth is wound presses against the under side of the sand roll. On such looms the cloth contracts less in width than on the old-style looms where the cloth passed over a breast beam, then was guided by rods down to the sand roll.

I remember distinctly when the high take-up loom first came out, we boss weavers thought that our weaving would not run so well because we were compelled to order more reeds of a little finer count and put more ends in our warps to get the same width of cloth.

The foregoing method of finding percentage of contraction is correct, but as there is no way of measuring the width at the reed on a style of goods a man has never made, I use a slightly different method to arrive at the percentage of contraction in order to have a figure which I can add to the width of the cloth wanted and get the width at the reed. By building up a record of many styles of goods an overseer will soon be able to make calculations for a style of goods which he has never made and come near enough to the correct figures for all practical purposes.

I divide the width of the cloth into the inches the goods contract and arrive at a figure which when added to the width of the cloth will give the width at the reed, although it is not the correct percentage of contraction.

Take our former example: 39⅛ inches is the width of the cloth on the roll and 2¼ inches is the contraction. $\frac{2.25 \times 100}{39.125} = 5.75$ per cent. Now if 5.75% is added to the width of the cloth (39⅛), the width at the reed will be secured. 39.125 × 5.75 = 2.4968 inches. Then 39.125 + 2.4968 inches = 41.37468 inches or practically 41⅜ inches width at the reed.

This is not the correct way to figure percentage, but it is a method which I have found very useful for the reasons mentioned.

After these percentages have been established for many styles of goods and also the dent reed used on all styles is known, it is very easy to get the exact number of ends to make any width of cloth. For example, suppose we wanted to make a style of goods as follows: 72 x 80 41-inch 4.00 yard goods, we would proceed as follows to get the total ends for the warp.

It is always advisable to add ⅛ or ¼ inch to the width of the cloth wanted because if we figure for the exact width, some few looms may have the tension too tight, as the warps run out, which would cause part of the cloth to be too narrow. Therefore, we will add ¼-inch to this style to be sure we get full width and please the customer.

41.25 inches wide × 5.75 per cent contraction = 2.37 inches.

41.25 + 2.37 = 43.62 inches wide at reed.

43.62 × 34 dent reed = 1,483 dents in use.

1,483 × 2 ends per dent = 2,966 ends + 24 ends for selvage = 2,990 total ends in the warp.

If we were ordering reeds for this style of goods, to get the correct reed dent, we would proceed as follows:

72 threads per inch wanted.

72 × .0575 per cent contraction = 4.14.

72 — 4.14 = 67.86.

67.86 ÷ 2 ends per dent = 33.93 dent reed or practically a 34 dent reed.

It is always advisable to get a reed long enough to practically fill up the reed space of the loom. Of course we must leave an inch or half inch on each side for adjustment of the reed. On a 40-inch loom, reeds made 44 inches long will fill up the reed space very well and leave some space for adjusting the reed one way or the other in case a few more dents should be left off on one side than on the other.

A reed which practically fills up the reed space on a loom gives a much smoother running shuttle and more than repays for the small extra amount which the reed costs. All the reeds in a mill should be the same length for each width of loom. Therefore the total dents will be 34 dents per inch × 44 inches or as the reed makers say 1,496 dents spread on 44 inches.

It is also advisable to have the reeds made 3½ deep inside the ribs as that will prevent the possibility of the yarn striking the top of the reed if the fixer did not get the harnesses divided properly when tieing in the warp.

The size of wire used to make the reed is a very important item, and although most of the reed manufacturers know and will use the size wire best suited to the dent reed being made, most overseers and superintendents like to know how to specify the size wire to give them the yarn space wanted.

Reed wire is always gauged in thousandths of an inch. Therefore 1,000 will represent all the *yarn* space and *reed* space in one inch. If we should want to know what the yarn space is when using say for example 13/1000 wire, simply multiply the number of dents per inch in the reed by the number of wire being used.

30 dent reed × 13 wire $= \frac{390}{1000}$ and 390 is of course 39 per cent of 1000. $\frac{39 \times 100}{1000} = 39$ per cent, and if the wire takes up 39 per cent of the space, then to find out how much space is left or what represents the yarn space, subtract 39 per cent from 100 per cent = 61 per cent yarn space.

A 34 dent reed using 13/1000 wire would have the following yarn space: $\frac{34 \times 13}{1000} = \frac{442}{1000}$. $\frac{442 \times 100}{1000} =$ 44.2 per cent. 100 — 44.2 = 55.8 per cent yarn space.

A well known reed manufacturer says the following sizes of wire are suitable for reeds:

30 dents per inch up to 37, use .014 thickness wire.
37 dents per inch up to 46, use .013 thickness wire.
48 dents per inch up to 50, use .011 thickness wire.

Several years ago the manufacturers greatly improved the running of weaving by allowing for more yarn space in the reed. They rolled the wire thinner but made it *wider* at the same time which left the dent strong enough to withstand the beating up of the cloth.

When shuttles have ridges on the back side which shows they are wearing fast, very likely the cause is that the reed dents are not in line with the reed. Years ago I stopped this wear on shuttles by placing the reed on a flat piece of plank just wide enough to fit between the ribs and passed a good new whetstone with about a ten-pound weight on it over the reeds, of course keeping the stone well oiled. If reeds were coarse I would use a heavier weight. Reed makers have practically overcome the trouble now by making much better reeds.

Most everyone knows how to figure the production of a loom, but there is no need for a man to figure so much when he wants to know quickly how many yards a loom will make on a certain style of goods, so I will show how to make a constant for loom production just as we have a twist constant or draft constant for a speeder or spinning frame.

First, to get production per week of 55 hours on a 40-inch loom making 160 picks per minute.

$$\frac{160 \times 60 \text{ (minutes per hour)} \times 55 \text{ hours per week}}{36 \text{ inches in a yard} \times 80 \text{ picks per inch.}} =$$

183 yards. Now to make the constant, take this same calculation and leave out the picks per inch.

$\frac{160 \times 60 \times 55}{36} = 14666$ constant for 55 hours on 160-pick loom.

To use the constant, simply divide the picks per inch of any style of goods into 14666 and we have the yards per week of 55 hours. For example

14666 ÷ 80-pick goods = 183 yards
14666 ÷ 40-pick goods = 366 yards
14666 ÷ 72-pick goods = 203.7 yards
14666 ÷ 64-pick goods = 229 yards.

The constant for a loom making 180 picks is secured as follows:

$\frac{180 \times 60 \times 55}{36} = 16500$ constant for 55 hours.

So it will be seen that constants can be made for any speed of loom and for any length of time, ten hours or 55 hours or 60 hours, and these constants are very handy because after referring to them in the notebook a few times to see what the constant is, it will be easy to remember them without referring to the notebook at all.

Some overseers may have need for a constant to figure cuts per week. Well, this constant may be found exactly the same way.

Example: How many cuts per week of 55 hours will a loom make on 40-pick goods, loom speed 160 picks per minute?

$$\frac{160 \times 60 \text{ (minutes in hour)} \times 55 \text{ hours}}{36 \text{ inches in yard} \times 40 \text{ (pick)} \times 60 \text{ yards to cut}} =$$

6.11 cuts. Now to get constant proceed as follows:

$\frac{160 \times 60 \times 55}{36 \times 60} = 244$ constant for 60-yard cuts in 55 hours on looms of 160 picks per minute.

244 ÷ 40 picks to the inch = 6.1 cuts.
244 ÷ 80 picks to the inch = 3.05 cuts.
244 ÷ 72 picks to the inch = 3.39 cuts.
244 ÷ 64 picks to the inch = 3.81 cuts.

To get the weekly production expressed in percentage it is necessary to keep a record of the number of looms operated each day on each style. If running 10 hours per day and five hours on Saturday, then only enter one half the number of looms for Saturday and it will make the calculation some shorter than having to figure everything out per hour.

Suppose we were running two styles, as follows: 400 looms on 80x80 and 300 looms on 72x76. The weekly report would be kept this way:

(*Continued on page* 399.)

Caution

Caution is care. It does not hinder, nor does it cause loss of time. It watches, it sees, it commands. Its one purpose is to lead the ship of business to success. It is common sense on the navigating bridge.

Business leaders recognize the present as a time of promise. But they preach CAUTION. Their advice is to resist temptations to heed boom talk; to seek sure profits and not to speculate; move solidly, rather than swiftly; to be vigilant. Business vigilance is impossible without facts and figures—complete, up-to-the-minute and dependable. Out-of-date figures, incomplete facts! They are the dead eyes of blind business. They are dangerous.

Sound methods of Cost Accounting are the one source of reliable facts and figures—the vigilant eyes of CAUTION on the navigating bridge.

ERNST & ERNST

AUDITS—SYSTEMS—TAX SERVICE

NEW YORK	CHICAGO	CLEVELAND	INDIANAPOLIS	NEW ORLEANS
PHILADELPHIA	MINNEAPOLIS	BUFFALO	TOLEDO	DALLAS
BOSTON	ST. PAUL	PITTSBURGH	ATLANTA	FORT WORTH
PROVIDENCE	ST. LOUIS	DETROIT	RICHMOND	HOUSTON
WASHINGTON	KANSAS CITY	CINCINNATI	BALTIMORE	DENVER

INCREASE in cloth production for a solid year's run can be shown with

"DUPLEX"

FLAT STEEL LOOM HARNESS

STEEL HEDDLE MFG. CO.

GREENVILLE PHILADELPHIA PROVIDENCE

Southern Office

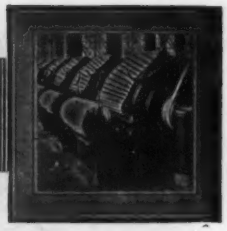
509 Masonic Temple : : Greenville, S. C.

Hampton Smith, Southern Manager.

N. B.—We are the sole manufacturers of Nickel-Plated Drop Wires for every kind of loom.

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects



We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Applying the Formula for Yarn Break on Adjusted Moisture Content.

EDITOR COTTON:

In the May 1922 number of COTTON appeared an article entitled, "Testing the Strength of Cotton Yarn," by A Tester. In one paragraph, this formula is given for finding the break on adjusted moisture content:

$$\text{Tensile strength corrected to 6.50 percent moisture regain} = \frac{\text{Machine reading} \times 139}{100 + (6 \times \text{actual regain})}$$

This is the formula recommended by the American Society for Testing Materials' Committee on Textiles.

I am interested in this, but cannot seem to be able to apply the formula. Will you please have the author of this article inform us, through "How Other Men Manage," what machine reading is referred to, dry bulb, wet bulb, or breaking strength? Also what the 139 in the formula stands for. Does "actual regain" mean amount of regain or the difference between the present reading and the former reading?

Also please have him apply the formula to the following:

Former: Dry Bulb, 72; Wet Bulb, 62; Regain, 7.33; Break, 75 pounds.

Present: Dry Bulb, 74; Wet Bulb, 67; Regain, 8.60; Break, 85 pounds.

Carder (Mass.)

EDITOR COTTON:

Replying to "Carder (Mass.)," with reference to the formula given in my article in May COTTON and repeated in his query, this formula is applied as follows:

The machine reading refers to the indicated breaking strength of the sample tested. That is, if the dial of the testing machine shows the sample broke at 150 pounds, this is the machine reading. The 139 is obtained in the following manner: The breaking strength of cotton yarn or fabric will increase from 5 to 7 per cent for each additional 1 per cent of regain up to about 8.5 per cent total regain. The formula estimated an average increase in breaking strength of 6 per cent. Now, we are correcting to 6.5 per cent regain. Multiplying, $6 \times 6.5 = 39$. Adding $100 = 139$. For the denominator we are using $100 + (6 \times \text{actual regain})$. The actual regain is the regain the sample shows when tested for its moisture content, or, the regain indicated by the wet and dry bulb readings of the atmosphere to which the sample has been exposed for a period of several hours. It will be seen that the tested regain will be more accurate, since it is difficult to determine just what the relative humidity of the air is to which a sample is exposed without very delicate instruments and having a testing room in which it is possible to accurately control the relative humidity.

Applying the formula to the examples given by "Carder," we have: Machine reading, 75 pounds; actual regain of sample, 7.33.

$$\frac{75 \times 139}{100 + (6 \times 7.33)} = \frac{10425}{143.98} = 72.4 = \text{corrected strength to standard 6.5 per cent regain.}$$

Example No. 2, with a machine reading of 85, and actual regain of 8.60:

$$\frac{85 \times 138}{100 + (6 \times 8.60)} = \frac{11815}{151.60} = 78.0 = \text{corrected strength to standard 6.5 per cent regain.}$$

It must be borne in mind that this formula is not absolutely reliable, but is a close approximation for purposes of standardization.

A Tester.

Why the Fingers Broke.

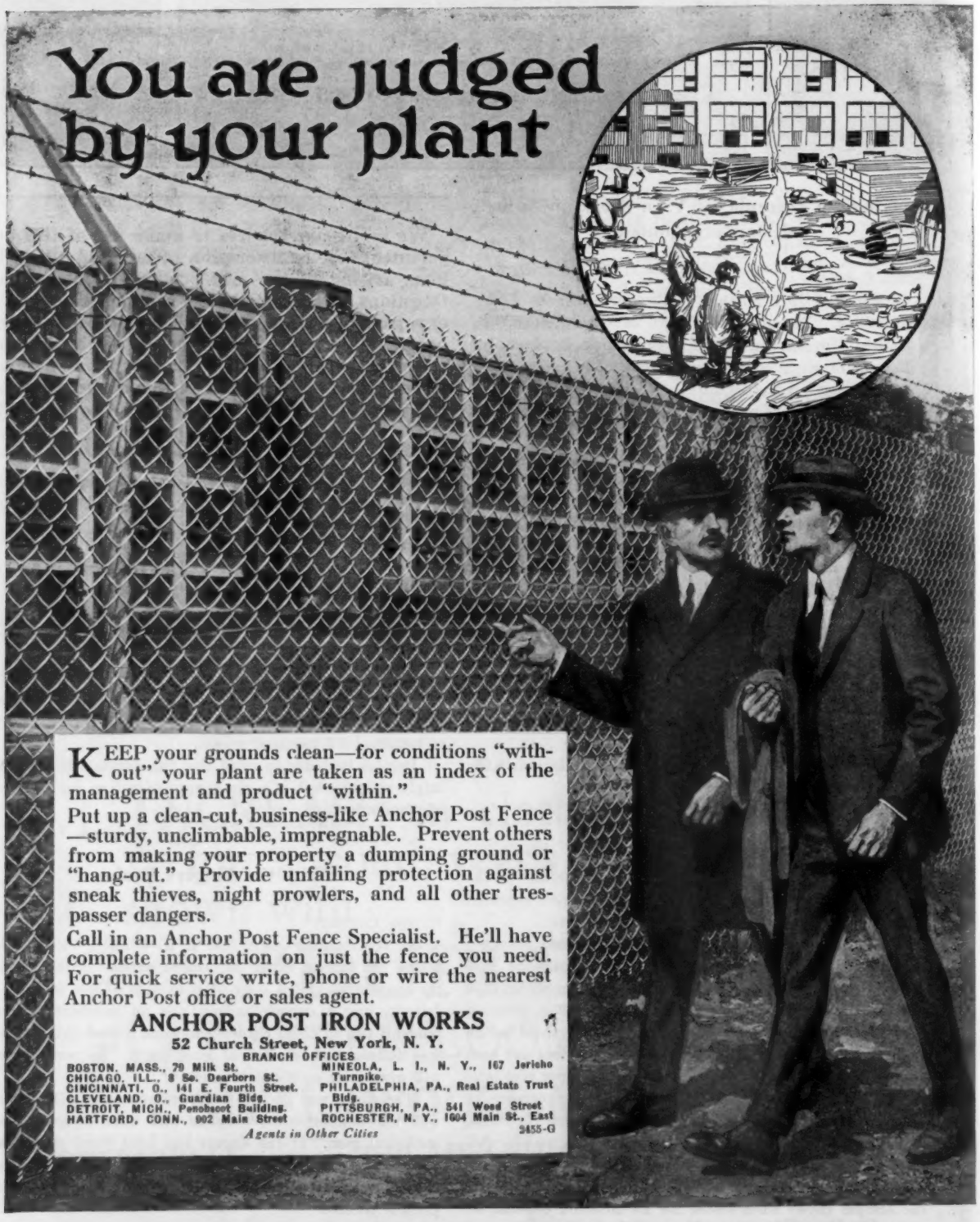
EDITOR COTTON:

In the January issue, "A. L. J. (S. C.)," asked what makes the fingers break on Mason cards. After reading his question, I sent a copy of it to each of five of my best friends, one a superintendent, one an assistant superintendent, two of them carders, and one a card grinder, who was formerly an erector of machinery. To save space I will give their opinions concretely:

The cause was due to poor workmanship. During the war the builders were helpless and were forced to hire inefficient men. If the fingers had been fitted snugly and properly riveted, and run at the proper speed to begin with, "A. L. J." no doubt would not have experienced his present trouble.

A comb speed of 1,512 r. p. m., was too high, and this caused the misfit fingers to vibrate until a certain amount of wear on the under side of the rivet produced enough space to allow the play that caused the comb to strike the doffer wire.

In such a case, the remedy would be to remove each comb when the card is grinding. Take it to the machine shop, and have a first-class machinist remove the blade;


You are judged by your plant
KEEP your grounds clean—for conditions "without" your plant are taken as an index of the management and product "within."
Put up a clean-cut, business-like Anchor Post Fence—sturdy, unclimbable, impregnable. Prevent others from making your property a dumping ground or "hang-out." Provide unfailing protection against sneak thieves, night prowlers, and all other trespasser dangers.
Call in an Anchor Post Fence Specialist. He'll have complete information on just the fence you need. For quick service write, phone or wire the nearest Anchor Post office or sales agent.
ANCHOR POST IRON WORKS
52 Church Street, New York, N. Y.
BRANCH OFFICES
BOSTON, MASS., 79 Milk St.
CHICAGO, ILL., 8 So. Dearborn St.
CINCINNATI, O., 141 E. Fourth Street.
CLEVELAND, O., Guardian Bldg.
DETROIT, MICH., Penobscot Building.
HARTFORD, CONN., 902 Main Street
MINEOLA, L. I., N. Y., 167 Jericho Turnpike.
PHILADELPHIA, PA., Real Estate Trust Bldg.
PITTSBURGH, PA., 541 Wood Street
ROCHESTER, N. Y., 1604 Main St., East
Agents in Other Cities
2455-G

FIRM — BECAUSE THEY ARE ANCHORED

Anchor Post Fences

PERMANENT — BECAUSE THEY ARE GALVANIZED

then each finger can be tested with a light hammer. Any experienced man can, by sound, detect those not properly fitted to the comb. When replaced on the card, he should not run them at a speed exceeding 1,200 r. p. m.

Wash (R. I.)

The Holdsworth Differential.

EDITOR COTTON:

If ten average Americans were asked about the origin of the differential used in automobiles, nine out of the ten would state that it was invented for the automobile. This would be a false verdict.

The differential was designed for a fly frame and was in use many years before the automobile was dreamed of. When the automobile did come along the makers simply copied the idea; and without the differential the automobile is impossible. What is known as "the differential" to automobile men is known as the Holdsworth differential to mill men—and the Holdsworth motion is only one of many different types of differential used on roving machinery. The Holdsworth differential is often spoken of as the sun and planet motion or the square differential.

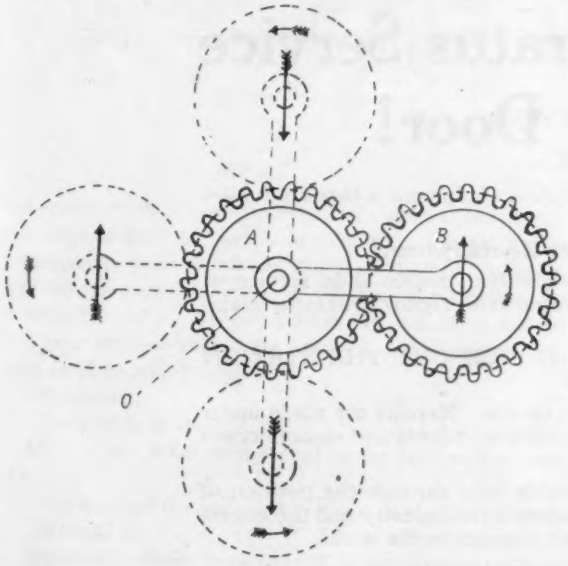


Fig. 1

It is the oldest and simplest type; was invented by Aza Arnold at Providence, R. I., in 1823 and was introduced into Enbland by Henry Holdsworth in 1825.

Cotton manufacturing presents some of the most difficult mechanical problems of any of the branches of science, and the manner in which these problems are solved is an interesting study. It has been stated a number of times that for one revolution of the sun gear the differential sleeve and bobbin drive gear turn twice. All old timers know this fact; however some carders know it only as a bare fact and understand neither how nor why. A few words on this subject may be of interest to the readers of COTTON.

Why is it that the differential sleeve turns twice for one revolution of the sun gear? Very often we can understand a proposition by looking at something like it. Look at Fig. 1, it may throw some light on the subject. It shows two gears A and B coupled together by a connecting rod or arm. Suppose that the gear A is held stationary and the connecting rod carrying the gear B is turned around it for ¼ of a turn. It will be seen by the position of the arrow that the gear B has made ½ a revolution. Suppose that the connecting rod is moved ½ a revolution from the starting point; it will be noticed by the position of the arrow that the gear B has made 1 complete revolution. Again, suppose that the connecting arm is moved ¾ of a revolution from the starting point; then by the position of the arrow it will be seen that the gear B will have turned 1½ revolutions. Finally if the arm is moved one complete revolution around the gear A, then the gear B will make 2 revolutions.

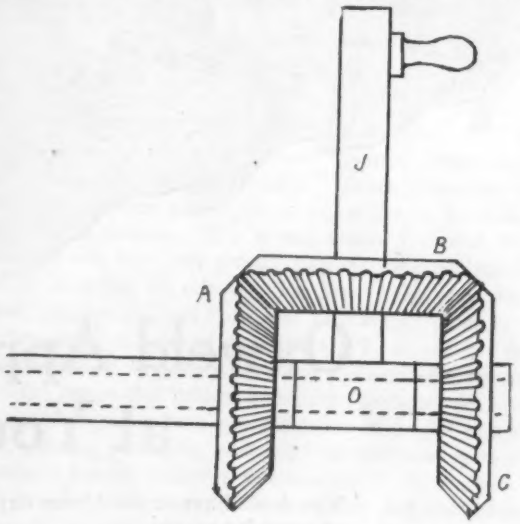


Fig. 2

Of these 2 revolutions that the gear B will make, 1 is on account of the gear B meshing with the stationary gear A. the second is on account of turning bodily around the center O.

Referring again to Fig. 1, suppose that A is free to turn; also suppose that the arm is turned around as before and the gear B is held so that the arrow will always point up. Under these conditions the gear A will make 2 revolutions for 1 revolution of the arm.

Another application of this principle is seen in Fig. 2, which is the gearing arrangement for a yarn reel. The gear A is mounted on the sleeve that carries the reel proper. The gear B is on the handle, and the gear C is a stationary gear, and is not free to turn at all.

If the handle J is turned carrying the gear B bodily around the center O, the gear B will make 2 revolutions just as the gear B described in figure 1. One revolution on account of being meshed with the gear C, and the second on account of moving around the center O. The 2 revolutions that B receives will be transmitted to the gear A. In this way 1 revolution of the handle J will cause A to make 2 revolutions.

Both of these motions described are on the same principle as the Holdsworth motion. Each is a form of, what is known as, an epicyclic train of gears. Epicycle may be defined as follows: one circle that has its center in the circumference of a larger circle. An epicyclic train of

Oxweld Apparatus Service at Your Door!

You don't have to send your oxy-acetylene equipment a thousand miles or more for repairs.

At least, not if you are an Oxweld or Eveready user.

We have available for you an established, nation-wide service—a rapidly growing chain of seventeen *apparatus repair stations*, maintained at important centers.

LOOK AT THE MAP NOW AND PICK OUT THE STATION NEAREST YOU!

Here you get high-grade, intelligent service. Repairs are made under supervision of factory-trained men—factory standards and economics are rigidly followed.

A service of such magnitude is possible only through the position of the Oxweld Acetylene Company as leaders in the industry and the largest makers of oxy-acetylene apparatus and supplies in the world.

Use this service—it will save you time and money.

OXWELD ACETYLENE COMPANY

Newark, N. J. Chicago San Francisco

Oxweld

WELDING AND CUTTING APPARATUS

World's Largest Manufacturers of Welding and Cutting Equipment

gears then would be gears that have their centers rotating in the circumference of a circle. Observation will show that each illustration given, as well as the Holdsworth differential, comes under this class of motion. The gear B in Fig. 1 has its center rotating in the circumference of a circle, and the same is true of the gear B in Fig. 2.

Figure 3 shows the Holdsworth differential. Its gearing is, for all practical purposes, the same as the yarn reel gearing in Fig. 2. The gear D that is simply shown in outline is not essential to the motion. It only makes the motion more perfectly balanced. The sun gear J takes the place of the handle J in Fig. 2. The gears A, B, and C, in Figs. 2 and 3, correspond to one another. The speed of the gear A and the bobbin drive gear G, both of which are on the differential sleeve, equals the r. p. m. of the jack shaft plus twice the r. p. m. of the sun gear. When the sun gear J is stationary the speed of A will be equal to

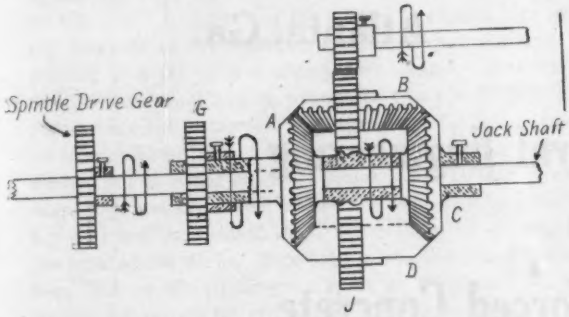


Fig. 3

the speed of the jack shaft, because the gears C and A have the same number of teeth, and they are connected by the intermediate gear B. When the jack shaft is stationary and the sun gear J is turned, A will make 2 revolutions for 1 revolution of J. Therefore when the jack shaft and the sun gear are both turned the speeds it would receive from each must be added together.

Example 1.

Speed of jack shaft is 300 r. p. m. Speed of sun gear is 15 r. p. m. What is the speed of the bobbin drive gear G?

The speed of G equals $300 + (2 \times 15) = 330$ r. p. m.

Example 2.

Speed of bobbin drive gear G is 450. Speed of jack shaft is 400. What is the speed of the sun gear J?

$$\text{The speed of J equals } \frac{450 \text{ minus } 400}{2} = 25 \text{ r. p. m.}$$

Example 3.

Speed of bobbin drive gear G is 390 r. p. m. Speed of sun gear is 18 r. p. m. What is the speed of the jack shaft?

The speed of the jack shaft equals 390 minus (2×18) equals 354 r. p. m.

The chief complaint against the Holdsworth motion is that the jack shaft and differential sleeve turn in opposite directions. The whole motion must be carefully lubricated and the gears made perfect in their contact with each other. A. J. D. (S. C.)

JAMES MILLER has been promoted from overseer of spinning at the Imperial Mills, Belmont, N. C., to the superintendency of the Linford Mills, of Belmont.

Licker-In Speeds.

EDITOR COTTON:

I would like to have this question discussed by your readers: We are running 1⅛-inch cotton with the licker-in on the cards making 450 r. p. m. and we wish to use waste strips from 1⅛-inch staple cotton. Would it be wise to slow down the speed of the licker-in or increase it? What difference would it make in the running of the work as regards lumps on the drawing and hard ends on the slubbers, and what effect would it have on the breaking strength? Contributor No. 31.

Eliminating Static.

EDITOR COTTON:

In the November 1922 issue of COTTON, writing on the subject of "A Static Eliminator," James Robertson described a practical design for a vapor pot to be made of steam pipe fittings. It is a well known fact that vapor pots of this type will greatly help in the elimination of static electricity in cold dry weather. They were widely used for this purpose both here and abroad prior to the development of modern humidifiers. Their use has been abandoned by the more progressive mill engineers, however, for the reason that modern humidifiers have proved greatly superior to vapor pots when installed in proper capacity, not only for the colder seasons of the year, but more particularly for use in the warmer seasons.

Mr. Robertson says: "The ordinarily sufficient humidifiers in the card room proved totally incapable of coping with the situation and the remedy was found in a very successful steam pot." As a matter of fact, the very existence of the condition which Mr. Robertson describes was an indication that the mill was both under-heated and under-humidified, for reasons which I shall undertake to explain.

Such a vapor pot as Mr. Robertson describes liberates saturated steam at atmospheric pressure which is nothing more or less than water vapor with a temperature of 212 degrees F. This vapor condenses into fog when it escapes into the air and so becomes visible to the eye, and then re-evaporates and mingles with the air at the room temperature. In the process it gives up to the room air a very considerable amount of heat which assists in warming the room. The surface of the vapor pot itself and the piping connected with it also act as a radiator, being at the steam temperature, and so still further assist in warming the room.

A vapor pot, therefore, is suited to improve conditions in cold weather in a mill that is otherwise under-heated and under-humidified, but it is absolutely unsuitable as a means for humidification in warm weather.

In summer, for instance, the temperature is high and if the mill is under-humidified and vapor pots are used, the result will be a still further increase in the temperature, while the relative humidity will increase only slightly, if at all. It is therefore practically impossible to produce proper humidities by means of vapor pots in summer because the resulting conditions are intolerable.

If all departments of the mill, including the card room, have sufficient radiating capacity to heat them properly, and have sufficient humidifying equipment for summer conditions, when the windows will be more or less open, no

EDWARD A. STUHRMAN

Mem. Am. Soc. C. E.
Mem. Am. Concrete Institute.

Candler Annex, Atlanta, Ga.

General Structural Engineering
In
Steel and Reinforced Concrete

Industrial Plant Layouts.

Warehouse—Factories—Commercial Buildings.

Accurate Preliminary Estimates of Cost.

Appraisals. Reports.

trouble whatever will be experienced in heating and humidifying in the winter and there will be no necessity whatever for vapor pots. Mill engineers and superintendents of well equipped modern mills will support this statement and point to any number of modern mills which do not experience the slightest trouble with static electricity and make no use whatever of vapor pots.

Vapor pots are not in any sense of the word a satisfactory substitute for modern humidifying apparatus. This is not a matter of individual opinion, but one of general experience and practice. T. E. M. (Mass.)

Making Two Sets from Eight Beams.

EDITOR COTTON:

Referring to the letter from "Mack (Ga.)" on page 223 of the January number of COTTON, entitled "A Discussion on Slashing," I understand the method he explains for making two sets of the eight beams; this is just the same as putting in a set on a double header slasher. However, I do not understand how to put in the two 1 x ⅛-inch lease rods mentioned in the sixth paragraph of his letter, where he says, "When laid in, pick up the bottom four ends all across, put in a flat steel rod about 1 x 3/16-inch beveled edge, then put in another rod of the same size between the top and bottom sheds;" etc. Where does he do this—at the back of the slasher (size box) where the ends have just been laid in the striking comb, or at the front? I will greatly appreciate his giving me all the information he can as to how to put these rods in so I can start the system on my 3,100 end warps. D. F. R. (S. C.)

EDITOR COTTON:

Replying to the query of "D. F. R. (S. C.)," who desires further information regarding my letter published in the January number of COTTON on "A Discussion on Slashing," and concerning my method for placing beams in the slasher, etc., will say first that the idea is about the same as putting two sets in on a H. & B. double head slasher, as he mentions; the difference is that the double header has two size boxes, and in placing the sections, the back set of beams went down under a roller below the front set and along under the first size box next to the beams, and up into the size box next to the cylinder, that set went onto the lower head at the front. While in the case we have under consideration, the front four beams go in the regular way, and the back four in the same way, but these four are brought up in a sheet of yarn over the top of the front four and tied onto the set as usual. If it is desired, a smooth roll may be placed just back of the top beam of the front four beams, and the sheet of yarn from the back four beams is run over this roll so that this sheet will not touch the two top beams of the front four, or, this sheet can be just run on over the top of the front beams without the use of this roll. Put strings in as usual. Do not use striking comb, but proceed slowly, trying to have a nice smooth sheet going into the size box for a few yards before putting in the strings. One always has the division before him; put the string in between the sets as soon as a yard or two of even sheet has gone into the size box, then put in the remaining strings, proceed as usual, having the front comb expanded to the width of the sections as nearly as possible.

When the dividing string comes just over the tin or iron roll at the front of the cylinder, slip in the rod carefully so as not to disturb the position of the two sheets of yarn. Then proceed to count in. One man can reach over from the front and take four threads from each sheet, or one man can count and hand over to another man at the front.

After laying in, slip a small wooden rod in between the two sheets, leave this rod at the back of the raddle temporarily, then proceed by picking up the bottom four in each dent at the front of the comb, using a double string. This does not take but a few minutes when one is used to it. Next slip one of the flat iron rods mentioned through that lease that is next to the spread bar. Now put the second iron rod through in front of the raddle where the wooden rod is keeping the dividing shed open, and take out the wooden rod. The proposition is now all ready for going It is just a lease four up four down, with the bottom sheet running on top of the rod next to the loom beam. The other rod is in the open shed. These two rods are in front of the comb. In a small hole near the edge of each iron rod we hook or tie one rod onto the other, a little space apart, and the rod nearest the comb is fastened loosely to the comb but strong enough to not allow the yarn to break the rods away.

With well made beams from the warper—or from the beamer if on colored work—one will have a good loom beam when once accustomed to this method. I got my idea from having much experience on heavy colored work, tickings, where we sometimes have as many as three colors in on a dent. This system is the thing to do away with double combs, and is used very extensively in the East.

If "D. F. R." or anyone else wants any further information, I shall be glad to give anything else that I can.

Mack (Ga.)

Give All the Facts When Writing.

EDITOR COTTON:

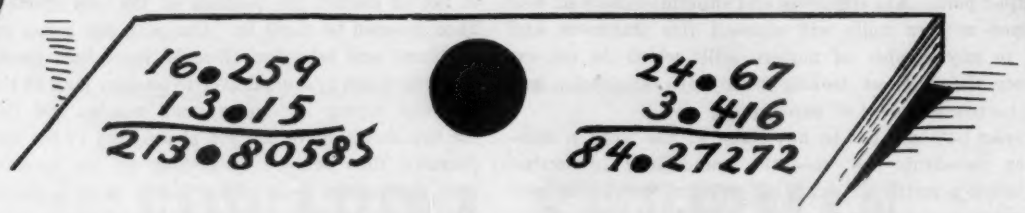
I would be pleased if some of the readers of the "How Other Men Manage" Department would express their views on the following points:

I often read articles in COTTON in which the speed of the beaters is stated, but from which we can form no clear idea of what kind of work they are doing. I will illustrate by an example, using a two blade beater as an illustration. Let us suppose that A has a beater running 1,200 r. p. m., and he says he is getting excellent work. B also has a beater running 1,200 r. p. m., and claims his work is the better. But neither states how fast he is feeding. We know that 1,200 r. p. m. for a beater on American peeler cotton is a good, conservative speed.

Now let us take A's beater. He has a beater running 1,200 r. p. m. Let us suppose his feed roll runs 8½ r. p. m. (2-inch feed roll). The number of blows which the beater makes in a minute is 1,200 × 2 or 2,400. The feed roll delivers 2 × 3.1416 × 8½ or 53.41 inches. Now dividing 2,400 blows per minute by 53.41 inches fed per minute we get approximately 45 blows per inch.

B also has a beater running 1,200 r. p. m., but his feed roll runs 7 revolutions per minute. If we figure this out we find he is getting about 55 blows per inch.

Here are two pickers, which you might say are running entirely different, yet to read an article you would think



Accurate Decimal Points

SUPPOSE you had a Scratch Pad with Decimal Points printed on it. Then when you wrote the two factors of a decimal multiplication with the whole numbers to the left of the points and the decimals to the right, the correct answer would automatically appear, *accurately pointed off.*

Such a Scratch Pad would be valuable to you. Accuracy of decimals is equally as important as accuracy of figures.

The Monroe Calculating Machine gives you Proven Results, *accurately pointed off,* in just the same way. As you "write" the two factors of any problem in the machine, you immediately read the Proven Answer, with the decimal point in the correct place.

Ask to see why users say "the Monroe is the finest Scratch Pad ever given a clerk." The coupon below simplifies your request.

Monroe Automatic—Marks a new era in Mechanical Calculating and Adding. A portable, electrically-operated machine for use either on desk or stand.

To Add or Multiply, simply touch the Plus (+) Bar. To Subtract or Divide, simply touch the Minus (—) Bar. The Proven Answers automatically appear with split-second speed.

Monroe Standard Model—Every feature of the Standard Monroe is conducive to speed with absolute accuracy. A forward turn of the crank to add or multiply; a backward turn to subtract or divide.

Special Models to fit individual requirements—British Currency Model, Fraction Models, etc., on which all ordinary calculations may also be performed.

There are Offices rendering Monroe Service at all Principal Points in the U. S. and Canada and throughout the World.

MONROE

REG. TRADEMARK

Adds Subtracts

Multiplies Divides

The 20-Place Automatic Model

Monroe Calculating Machine Co., Woolworth Building, New York

"If you need a thing you pay for it —whether you buy it or not"

Without cost or obligation (check as desired):

[] Send further information on: [] Arrange for demonstration of:

[] Automatic Model [] Standard Model [] Fraction Models [] British Currency Model

*Firm Name*_____ *Individual*_____

*Address*_____ *City*_____ *State*_____

C-3-23

they are the same. A third person reading the article might say, "Here are two men, both running their beaters at 1,200 r. p. m., and both getting good work. Now I am getting poor work running mine at 1,300 r. p. m., so I will run it at 1,200 r. p. m."

He makes the change, but does not take into consideration the blows per inch, and when he slows up his beater he slows up his feed roll to 6 r. p. m., which gives him 63.5 blows per inch. After running a while he notices there is no improvement in the work and he goes back to 1,300 r. p. m., and at the same time thinks A and B do not know their business. But if he knew that A and B were giving about 10 to 20 blows per inch less than he was he might change his opinion.

Therefore, I say, if a writer told how fast his beaters run, how fast he was feeding and the kind of stock he was running, the reader would be better informed to figure out why he was getting better work. We have always figured the beater speed on the basis of blows per inch, and would welcome any comments from other readers.

I would also like to say a few words about one of the statements "Wash" has made concerning the fly frame, and, by the way, if we are to believe "Wash," the modern frame belongs on the junk heap and not in the mills. However, I enjoy his articles very much; there is much food for thought in them.

"Wash" asks, "What makes the ends on a slubber slacken up if you run fast on the first layer?" According to my way of thinking, the answer is quite simple. When the frame is started after a doff the belt is on the small end of the driven cone, therefore it has less surface to ride on and it cannot grip the cone as well as if it were on a larger cone. But the belt is the most responsible agent in this instance. It the cone belt did not slip the ends would not slacken, therefore what is needed is a belt that will run the driven cone equally throughout the set. It may surprise "Wash" to know that our slubbers can be started full tilt on the first layer without the least slackening of ends. The reason is that we have them equipped with an almost perfect cone belt. It is a rubberized cord belt which entirely or almost entirely eliminates slippage. We have been running these belts for a year and a half, and have found them greatly superior to other belts we have tried as regards wear, and they eliminate slippage to such an extent that on changing to a rubber belt we are obliged to change our bottom cone gear several teeth larger. Vic (Mass.)

Setting a Whitin Model C Comber.

EDITOR COTTON:

In replying to "Bab (N. C.)," who asks in the December number for information on timing and setting combers, I wish to say that he is asking for a great deal in a short space. I will not tell him how to erect a machine as received from the shop, but will tell as well as I can how I reset a Whitin comber and give him some idea as to how I time them, using 1 5/16-inch cotton, 450 to 465 grain lap, allowing 18 to 20 per cent waste on a model C machine.

In taking down a comber I pull it down to the stands, taking out the steel roll, the nipper frames and feed roll, brushes, waste chutes, nipper rod shaft, cam shaft and draw box rolls. These are cleaned by the operator of this machine. In starting, I first level the machine, clean bearing for cam and nipper shafts, putting oil in bearings and then put the shafts in place and screw the caps up tight, trying these shafts to see they are free; if they are not, I find out where it is binding and rectify the trouble.

Then put in the waste chutes, fasten to beam, and looking over the needles on the half-laps, straighten them where possible and replacing all those that have gone bad.

Put in the brass bearings for the steel detaching roll, putting a drop or two of oil in each one. See that the roll is well cleaned and whitened, put it in the bearings, put on the caps and tighten up. Turn the comber, by hand, until the pointer is opposite 9½ on the index gear and gauge with a 22 gauge between the roll and the segment. After gauging the eight deliveries, try the roll by hand to see if it runs free. This is done by turning the large gear on the notch-wheel shaft. Do not leave this important feature until the roll runs smoothly and freely.

Now fasten the top of the waste chutes, pressing the leather strips against the roll.

Turn the cylinder shaft backward until the pointer is opposite 5 on the index wheel and use 1⅛-inch gauge between the roll and the front of the segment on the eight deliveries. The set screws that hold the cylinders are found back of the segment between the segment and the half-lap, and are reached by removing the cylinder tin. Keep the cylinders evenly spaced between the stands; in loosening and moving one is likely to move them closer to one bearing than the other. Be sure also that the pointer is at 5 at all settings as this setting is being made to line up the segments with the steel detaching roll.

Put the feed roll in place after it is well cleaned, using a 1¾-inch gauge between the detaching roll and the feed roll.

Clean the nipper frames at the bench where there is room, and see that the fibers are in good condition; these can be turned around, and used, if one edge is badly worn. Place the nipper frame on the bench cushion plate up, with the fiber touching this, and holding it thus, with one hand, take a 22 gauge and set the cushion plate from the nipper knife nose so the gauge will run through fairly loose. Do not have a tight setting. Make the plate fast and try a piece of paper between the fiber and the plate, having the knife hold the paper at each edge and in the center. Now try the 22 gauge again and see if it is all right, remembering that the cushion plate comes next to the half-laps when running and that a set screw left loose will cause a *wreck* and lots of trouble.

The oil holes should also be cleaned out in the frames. When this is done, take the frames to the machine. placing them on the floor in rotation according to their numbers, putting them together with the frame stand, and run the feed roll through, placing the gear on the end. Get three men to help lift the frames and roll in place on the stands. Never have the needles up when this is done as there is a likelihood that many needles will be broken or bent.

Put the bolts and set screws in, setting them up tight with the fingers. Turn the cylinder shaft so that the nose of the knife comes between the segment and needles. Take the angle gauge and fasten to the knife; the stop screws, by the way, are loose. Use the right hand stop screw of each frame and get an angle of 37 degrees and fasten the check nut.

After the eight frames are set carefully, turn the cylinder until the first row of needles comes under the nose of the

INDANTHRENES

Your inquiries are solicited for Indanthrene, Helindon, Thio-Indigo, Hydron, Algol, and other vat colors. The following is a list of some of the more important which we are prepared to furnish from stock or for import.

Indanthrene Yellow GK
Indanthrene Orange RRK
Indanthrene Orange 6 RTK
Indanthrene Brown G
Indanthrene Brown R
Indanthrene Red 5 GK
Indanthrene Corinth RK
Indanthrene Brilliant Violet BBK, RK
Indanthrene Blue RK
Indanthrene Blue GC
Indanthrene Blue 5G
Helindon Pink R Extra
Helindon Pink B extra
Helindon Red 3B
Helindon Orange R
Helindon Black Vat T
Algol Brilliant Orange FR
Algol Brilliant Violet R, 2B
Algol Brilliant Red 2 B
Hydron Navy Blue C

Also a complete line of Acid, Basic, Chrome, Direct and Sulphur Colors, Intermediates, Cotton Finishes, Turkey Red Oils, Soluble Oils and Leather Oils.

Manufactured by the following and other American Manufacturers

CONSOLIDATED COLOR & CHEMICAL CO.
CENTRAL DYESTUFF & CHEMICAL CO.
WILLIAMSBURG CHEMICAL CO.

H.A.METZ & CO. Inc.

One-Twenty-Two Hudson Street, New York City.

Boston Philadelphia Providence

Chicago Charlotte San Francisco

nipper knife and start setting with the two middle frames, using a 1 5/16 comber gauge between the detaching roll and the front of the cushion plate, and just pinch up the bolts and cap screws, that hold the frames, with a wrench. Place the thumb on the knife and set so a 20 gauge will pass between needles and knife. Try the 1 5/16-inch gauge again and repeat with the 20 gauge again until they are both a good setting.

If necessary, the angle of the knives may be changed. I think the 1 5/16-inch gauge and the 20 gauge are more important than the angle. Now make the two middle frames fast and proceed with the other frames, working toward the end each way. When this is done only one stop screw is fast. Place a piece of paper back of this screw and next to the frame and with another paper place against the frame where the left hand screw will touch. Turn up this screw until both screws hold both papers, tighten the check nuts and try the papers again.

Do all the frames in this manner, then set up the back stop screws with the fingers as tight as possible and with a wrench just pinch them up hard and tighten the check nut. I said pinch it up tight; do not set up too hard or a new frame will have to be put in. After I set up the stop screw with my fingers I can turn the stop screw up usually about one flat on the head of the screw—and I presume what I mean by that is understood. When this is completed the frames are done, ready for the next setting.

Look over the brushes and brush bearings, place a little oil in the bearings, put the brushes in place, put on the caps and set them up tight. Set the brushes so the bristles just touch the fourth brass bar on the half lap, set up the brush bearings and turn the cylinder shaft until the brushes clear the half lap. Now turn the brushes by hand to see they run freely. If they do, gear up the brushes ready for action.

Put in the nipper rods, set the pointer opposite 11 on the index gear, put in the cam balls and have the nuts on the small cams up on the front side so the cams can be moved readily if necessary. Place two papers under each of the knives and tighten up the nuts on the nipper rods until the papers can just be drawn, set all the knives and with the hand turn the cylinder shaft backward to see if both sections of knives come up together. They should and can be made to do so by moving the small cams; the nuts, remember, are on the upper side of cams and are easily moved.

Carefully turn the cylinder shaft until the first row of needles comes under the knife. Then gauge with a 20 gauge, turn the cylinder shaft again until the 5th or 6th row of needles comes under the knife, and gauge with a 20 gauge again, draw the knives away if necessary, but never drop them closer to the needles, as the needles will strike the knife since the first row of needles was previously set with a 20 gauge. Continue turning the shaft four or five rows at a time until all the needles are gauged. Bear in mind never to drop the knives after they have been set to the first row of needles.

Turn the cylinder shaft until 7 is opposite the pointer and set the top combs to a 30 degree angle and use a 20 or 21 gauge between the segment and needles on the top comb. In getting the angle I usually use my leather detaching roll, placing a strip of tin the length of the roll about 1½-inches wide between the steel detaching roll and the leather roll, bringing the top comb up against the leather roll. This leaves a little space between the roll and top comb when the machine is running.

Turn the shaft again until 8 comes opposite the pointer and set the leather detaching roll.

Using a 25 gauge between the roll bearing and blocks, having the weight hooks on the rolls.

Clean the brass detaching rolls and put in, set with an 18 gauge between the brass roll and the leather roll the index gear still at 8 opposite the pointer.

Put in the sliver pans, brass clearers and lap aprons, having the brushes just touch the roll.

Scour and put the draw box together, tighten the small gear on the feed roll and put on cover. Have a couple of men help put up the doffer and set so there will be a small space between the wire and brushes. Do not have them touch as this breaks the bristles and makes bunchy waste. Put up the doffer comb and fasten; put on the springs on the top feed roll arms and put in the doffer covers.

Put in the pawl arms and fasten; try these to see that there is a little play in them. After both are in place, springs and rolls in their places, turn the cylinder shaft until 6¼ come opposite the pointer. Now turn the cams until the detaching roll starts forward. Put the timing gear in mesh with the carrier gear, driven by the main driving shaft gear and tighten up the gear. Then try this cam again to see the timing is right. Try the other cam and have the roll start forward at 6¼ the same as the other cam, if it doesn't set the cam so it will.

Now time the feed, usually at 6, but the percentage of waste can be regulated. Feed earlier for less waste and later for more waste. I usually feed from 5 to 6¼ with good results.

Put in the laps and short feed roll and start the comber.

I feel sure "Bab" will have good results from these settings. He should bear in mind, however, that a man cannot throw a comber together and get results.

I should be glad to have "Bab" advise us through the Practical Discussion Department how he makes out with these settings if he tries them. Receiver (Conn.)

Overcoming Loose Threads.

EDITOR COTTON:

Reading the letter of "Mack (Ga.)" in the September issue brings to mind an experience of my own with "flat threads" as he calls them—we commonly refer to them as "doubles" or threads that have been slashed (sized) together. The remedy for this is to have them re-leased on the back of the slasher and the front lease rods straightened out to make them straight on the front of the slasher. If the warps are leased correctly on the back of the slasher, there is no excuse for "doubles." Of course the proper precaution must be taken at the tying-in machine, but if the proper selectors are used on the tying-in machine, and the right sizing of the yarn secured, it is not likely there will be any trouble with the selectors selecting the single strands as they should.

But I am getting a little ahead of my story. We were having trouble with just what "Mack" talks about in his letter: slack threads, and "flats." We set in to locate the trouble, on the "flats" first. This we finally overcame by putting a lease rod between the size box and the cylinder, dividing one-half of the threads as they left the size

Neither a day, nor a month, nor even a year will give you the time to "prove out" the standards of a house like R&H. That priceless confidence in R&H Chemicals possessed by the men who buy them is a product of forty years of successful tests in practical use.

R&H CHEMICALS

Epsom Salts

U. S. P. and Tech.

Glauber's Salt

Crystals

Sulphide of Soda

Broken Pieces, Fused and Crystals

A partial list of textile chemicals for which we are headquarters.

Oxalic Acid
Albone (25 volume Hydrogen Peroxide)
Alumina Sulphate, 17/18% Iron Free, Powd. Lump
Antimony Salts 65%
Bleaching Powder (Chloride of Lime)
Epsom Salts (Magnesium Sulphate)
Blue Stone (Copper Sulphate)
Glauber's Salt
Formic Acid 90%
Formaldehyde
Bichromate of Potash
Carbonate of Potash
Caustic Potash
Permanganate of Potash
Chlorate of Potash
Yellow Prussiate Potash
Caustic Soda
Sodium Acetate
Bisulphite of Soda
Solozone
Sodium Sulphide—60% Conc. (Broken Pieces)
Sodium Sulphide—Crystals 30/32%
Tri Sodium Phosphate
Sugar of Lead—Brown and White
Zinc Dust
Y. P. Soda
Chlorate of Soda
Nitrite of Soda
Chrome Alum
Barium Chloride.

41st Year

The ROESSLER & HASSLACHER CHEMICAL Co.
709 Sixth Ave., New York

box, and before the warp reached the first cylinder. This insured having half of the threads separated while the warp was wet from the size box, and to be dried on the cylinders, the remaining half, or whatever the number of the section beams was that was being run on the slashers, was to be divided on the front by the lease rods on the front of the slasher.

We finally got this straightened out, but the boss weaver kept complaining that there were more slack threads coming up on the yarn on the looms. That kind of trumped us, but we went to work to find more loose threads. We found them first caused by the spooler hands—they would let the threads loose too fast for the spool to wind the thread up on, and therefore a "kink" would be formed in the threads at the knots, and when this would come up on the looms it was a slack thread and the drop wires would cause the loom to stop off.

This we remedied by having the spooler hand—as it happened she was a learner—to let the spool loose a little faster than she had been doing. In spooling, the spool must be turned loose a little in advance of the thread from the full bobbin that is being tied up on a spool.

When we thought we had it fixed, the boss weaver says "No, they are still coming." At first we thought he was just "surmising," trying to find fault, to get by with something, and to push the responsibility off onto someone else. However, we gave him the benefit of the doubt and proceeded to hunt for something else, in the meantime making a careful survey of the weaving conditions; not finding anything of importance in our investigation, we proceeded to hunt elsewhere.

We decided to inspect the warper creeling, and the running of the warpers, and we found that they were not running as they should because of the settings of the warper cones. They were set so as to run too fast when the warper beams were about full. We adjusted that, and all other mechanisms of the frame, and finally decided to pass it up, when one of the warper tenders walked up and said, "If y'all will fix some way for them spools in the creels to run the same there will be less slack ends in the beams." That started something, as we all know that there are almost as many conditions in the warper creels as there are spools in the creels so far as friction is concerned, and friction was what was giving us the trouble. Some spools were being unwound faster than others, and the tight ones were the ones that were showing up the slack ones on the looms and causing the looms to stop off so often.

In substance, it was this: the spools in the warper creels that ran off too freely were the ones giving the trouble on the looms stopping off. What's the remedy? Friction on the loose threads. How? It was finally decided to cover the rolls that the threads ran over, and under, before they got to the drop wires on the front of the warper. We tried several methods, but finally decided on covering the one preceding the take-up roll on the warper.

The take-up roll is the one that, when the warper stops off, rises up and takes up the slack to keep the yarn from kinking from the spools as the warper slows down and stops. We tried covering several different rolls, but this one just behind the take-up roll served us best, and the slack threads almost disappeared, and it surely did look pretty on the back of the slashers to see them run off so smoothly after we got a full set on.

This roll was covered with slasher cloth, 14 ounces per yard. We know this roll is driven by the threads from the warper creels; this being so, we understand that the tight threads do the driving, so the slack ones come loafing up, at the mercy of the beams on the front of the warper as to how fast they are drawn over, consequently making slack wound threads on the beams, and slack on the slashers and looms.

This covering on the rolls will have to be renewed occasionally, as the constant running of the threads on them will wear them threadbare, thus decreasing the friction, and they will be of no service. Anyone who has not tried this system of taking up the slack in the yarn will be surprised at the results. It's this way: the tight threads run the rollers, and loose ones run at will, and if there is not some kind of friction to check the loose ones, slack threads are certain with a bad effect in the weaving.

A word in conclusion about weak yarn may not be amiss: It's true that weak yarn can be made in the carding and spinning, but supposing it is not, then on the slashing if it is not treated as it should be treated, weak yarn is more frequent at the slashers, according to the dressing it receives. It may be the way the size is boiled and put into the yarn, or it may be the result of the steam pressure that is carried on the cylinders, or the tension it receives either before it gets to the cylinders or from the rolls connecting with the yarn last, or the take-up rolls on the front as it goes to the loom beams. Care should be taken to see that the yarn is not stretched on the slashers. There could be lots said on slashing—and then some would be left out.

T. A. D. (Ga.)

Use a Task Wage.

EDITOR COTTON:

When I wrote my letter entitled "An Opinion on Management," which appeared in the October issue of COTTON, I aimed it at all superintendents that whistle at the help and give orders to this or that hand in a room without first consulting the overseer. In such a case the overseer is a joke.

COTTON is so widely read that I thought such fellows would read my letter and take the hint. I have no pity for any overseer who will stand for such treatment. I would either be overseer or resign.

"Ted," who comments on my letter in the December number, should have understood that my letter referred to large concerns, for I terminated it thusly. "He should go to the overseer, and not interfere with the help." If he is also overseer, that is different, of course.

I am unable to agree with "Ted" as regards paying more wages to get a better class of help, for two reasons: First, for the sake of illustration, let us assume that "Ted" is manager of one mill, and "Wash" manager of another. "Ted" advances wages and this attracts my best help away from my mill. Will I not, if possible, advance wages also? And if I should, would "Ted" advance again? Where would it stop?

Then suppose we both advanced wages, and in a short time a general advance was given in all other mills, our help would demand the advance, would they not? I believe in paying the highest wages possible, but it must be done by a task wage.

Wash (R. I.)

QUALITY

But THIS Is Not "Bull"

Some advertisements which you read may contain a little "bull," but this one does not. And it's not "bull" when users of Bondaron Textile Leathers make statements like the following:

Last month the Boss Weaver of one of the South's largest mills advised us that the first "Bondaron" Check Straps placed on his looms in October, 1920, were still giving entire satisfaction. The Superintendent of another large Southern mill told us a few days ago that the first "Bondaron" Check Straps placed on his looms have given 35 months' service, day and night run, and so far there has not been a worn or broken strap.

These are only two of the many records of satisfaction and long life experienced by users of

Bondaron

"The Leather with the Hair On"

Check Straps

In actual use they last from two to four times longer than the ordinary straps—simply because they are made from higher quality, specially selected Foreign Hides, tanned by a valuable, well-guarded process which produces leather of amazing strength. The hair is always left on the leather for we never use weakening chemicals to take it off.

Bondaron Lug Straps, Harness Straps, Cone Belts, Round Belting and other Textile Leathers contain the same high quality materials and give long lasting satisfaction and economy.

Manufactured exclusively by

CHARLES Bond COMPANY

Leather Importers, Curriers and Belt Manufacturers

617-619 Arch St. Philadelphia, Pa.

LEATHER

GARLAND

IF YOU ARE NOT QUITE SATISFIED NOW

Try a GARLAND Standard Grade LOOM HARNESS

No better looking, better weaving or better weaving loom harnesses can be made than those we are turning out. The best materials, great care in manufacturing and rigid inspection from the knitting to the finished harness are bound to produce harnesses of superior quality.

TRADE MARK

GARLAND MFG. CO.

SACO, MAINE

Warren Soaps

Preferred Stock

The best quality tallow, palm, and red oils and olive foots, carefully balanced with the purest chemicals for your special purpose.

Uniformity guaranteed by test before shipment.

Warren Soap *Warren Service*

Warren Soap Mfg. Co.

Established 1870

77 Summer St. Boston, Mass.

Incorporated 1890

What Causes The Spindles to Break?

EDITOR COTTON:

I have in my room 218 Lewiston broad looms. The 81-inch looms are running 114 picks; the 90-inch looms are running 106 picks; and the 99-inch looms are running 100 picks. The variation in speed on these looms is anywhere from four to eight picks higher per minute at times. These looms are run by five motors by sections. We condition our cop filling one hour by steam in a conditioner. Now, I am breaking spindles about 700 to 800 per year, and I think that is too many. We are running two different makes of spindles, but can see very little difference in the breakage of the two kinds. They break at the bottom end quite a lot, say 30 per cent, and the rest break at the small end.

I would like to have some readers tell me what might be causing this and how I can prevent this excessive breakage.

Overseer Weaving (Maine.)

Slubbers and Speeders.

EDITOR COTTON:

After the drawing frames, the slubber is the next process that engages the attention of the carder. Here he enters upon a new experience. With continued extenuation of the fiber, the strength of the sliver is giving out, so a machine is brought into use that will reduce it still more and preserve its uniformity.

In operating a slubber, the first thing to do is to get the slivers up out of the drawing cans without racking or attentuating them. This may be best accomplished by setting the cans well under the lifting roller. By so doing we avoid the friction incidental to the slanting and rubbing against the edges. When we see the slivers back of the slubbers falling back into the cans, and refusing, on account of weakness or some other cause, to continue the process, we may be sure that there is something the matter that will require careful investigation.

There are a number of things that may be the cause of this. The drawing rolls may not be properly adjusted. If this is located in the preceding process, the weak parts will be separated but a short distance; but if they occur further back they will be much further apart. This is a practical way of locating faults. All the overseer has got to do is to give his attention to the distance these tender parts are separated from each other, and by examining the drafts to which they have been subjected he may determine where the trouble is.

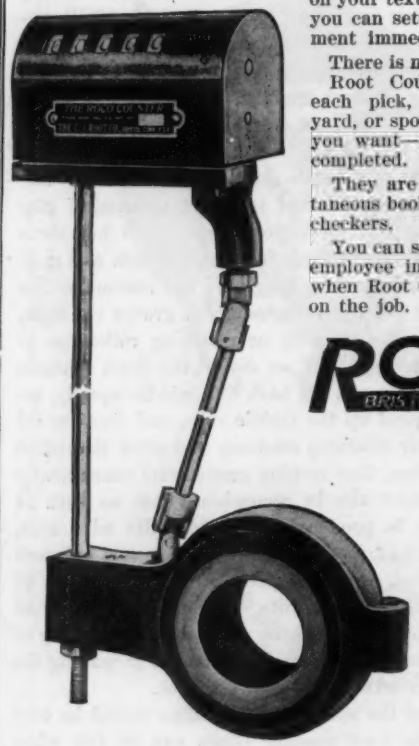
Still there are other reasons for this breaking down behind the slubbers. It frequently happens that the drawing is running with an allowance of draft between the front and condensing rolls for the purpose of keeping the sliver taut. When running on heavy work, although some inquiry is made, yet through the strength imparted by the extra weight the damage may be imperceptible. But let us change to a lighter class of work and the slivers will probably not bear to be pulled up out of the cans. Let us get one tooth more for the condensing roll and note what a difference is made. If the sliver is strengthened by the change we may congratulate ourselves upon having practically straightened out a part of the process, which was not as it should be.

The surfaces of the front and condensing rolls should run at exactly the same speed. Be it remembered that the stock is made as nearly parallel by drawing on the preceding machinery as is prudent, for the sliver must have a consistency sufficient to sustain its own weight. Still, before twist is given, there is another draft to be added. Thus it will be seen that care and skill must be used at this extreme stage to prevent over-drafting.

I have been persistent in this article in directing attention to this point, knowing how important it is and how easily too much draft may be given to the slubber. Experience has demonstrated that the most economical machinery on which to draw cotton should have but three rollers with just sufficient draft between the back and middle to prevent the sliver from bagging. The reason for this is that the slower the roller moves which grasps the fiber, the greater chance the drawing or revolving roller has to make the work uniform. If we divide the draft between the front and middle and the back and middle equally, we must of course speed up the middle rolls, and these would naturally lose their retaining tendency and allow the cotton to give out in flakes, thus causing uneven and consequently weak yarn. It must also be remembered that no yarn of good quality can be produced if we slub with wide rolls, and this is a part of the business of carders and spinners that is, to my mind, greatly neglected. What is the use of the trouble of shifting the rolls for one-sixteenth of an inch? asks a carder. But we know the closing or opening of the rolls that distance has often done wonders in making the yarn to both spin better and break stronger.

The tension of the ends on the speeders should be very light, so that the least possible strain can be felt when touching them with the finger underneath. There should be just sufficient tension to reach the flyers without too much hanging. If there should be any drag, it will surely twist at the rollers. It is common to see the speeder-ends, especially those of the slubber, so tight that they pull with strain and make tender places in the roving. Having the twist light and the tension easy to produce good drawing on the next machine is good advice. Hard twist may keep ends from breaking, but it draws badly on the following frame, and cuts and hollows the leather rolls. If there are any tender places arising from poor drawing, wide rolls, or uneven feeding in of waste on the pickers, the twist running up into the bite of the rollers will pinch these most. Some of these places occur at irregular intervals according to how the doublings acted on them in the previous processes. The remarks regarding tension stand good for all kinds of speeders, whether on coarse or fine hank.

The retarding or tightening of the let-off is another of those small affairs which are productive of consequences of which the operator may not be aware, but which often take considerable ingenuity to trace out. The system of "thumbing" the rolls is bad enough, but not nearly so injurious as that of tightening the ends. Let us take a frame on which we find a number of slack ends and set the rack to suit them; what effect has this operation on the other and much larger number of ends which are running at the proper tension? Will these break down? No, but they will pull and tug until they equalize the diameters of the bobbins by tighter winding. The loose ends referred to have been made so by neglecting to piece up in time, so that the bobbins are somewhat less in diameter. Now the winding-on having but the same length of delivery, must of course strain and tug at the roving to accommodate the greater circum-



With Root Counters on your textile machines you can settle the argument immediately.

There is no come-back. Root Counters count each pick, hank, foot, yard, or spool—anything you want—just as it is completed.

They are your instantaneous bookkeepers and checkers.

You can settle with an employee immediately—when Root Counters are on the job.

ROOT

Ask us "How it is done"
We will gladly tell you

CARD CLOTHING

[CLECKHEATON]

WE take great pleasure in informing you that we have been appointed sole agents in the United States for James Taylor & Sons, (Cleckheaton) Ltd., Cleckheaton, England—card clothing manufacturers.

Taylor's (Cleckheaton) Card Clothing, although new to this country is known all over England and the Continent for its quality. In fact there is no other card clothing made which compares with Taylor's (Cleckheaton), for evenness and lasting qualities.

Let us quote you prices - you will find them very reasonable, and the quality and service second to none.

Manufacturers Machine Company

NORTH ANDOVER MASSACHUSETTS

ference upon which it has to be wound, and this tension affects the weaker parts, for it is well understood that if we pull a piece of roving, the tenderest portion will stretch. Therefore, attentuations formed by pulling down or tightening the ends are very slender and feeble, but not so much so that they will break down, except in extreme cases, either on the frame or in the creels, because they, so to speak, "swallow up" the twist which strengthens them sufficiently for future mischief.

This refers, of course, to only one of the many things in the building of a set of roving which will cause weak parts, such as neglected rollers, unequal pressures, or a poor cone belt. But this tightening circumstance may and does frequently happen after the overseer has spent hours of his time tampering with the machine and putting it in shape for first class work. He is therefore off his guard, and in passing, if he finds the machine running, he takes no further notice of it.

From what has been observed in describing the failings of speeders and those attending them, it is not to be inferred that doublings are of no value in the preparation of roving. The writer has invariably maintained, in the face of opposition from practical men, that the mill that runs the most doublings produces the best work, provided the stock and machinery are equal. But doublings are like drafts, and ought not to be the cause of weighty drawing on any of the machines to which they are put in process. My idea has always been, and no reason has yet appeared sufficient to alter it, that if heavy, and therefore cloudy and bunchy drawing is the outcome of stuffing in doublings for the purpose of having as large a number as possible, a considerable reduction of these would be productive of better work and stronger yarn.

Seeing that we are at present dealing with the speeders, our object will be to offer such suggestions as will not be disappointing to any who will take the trouble of putting them to the test. One of the first things to do is to look closely into the condition of the steel rolls, on which we are going to make roving. Put a straight edge along the bearings, and prove to our own satisfaction that these are perfectly level and that the journals will bear equally the whole length of the machine. Caliper the rolls in several places and satisfy yourself that they are sufficiently near, so that there will be no possibility of one of those troubles after starting which no person can account for. If the machine is old, see that the joints do not make a quarter turn, and that the flutings are not gone or hollowed down where they are in constant contact with the cotton. The rolls must be sharpened so that the edges of the flutes will offer equal resistance to the drag, and that there will be no uncertainty about the slip or escape of the fiber when brought under for the purpose of reducing.

Observe that there is no wabble to the rolls, caused from springing or misplaced joints, because that means uneven roving and lots of it. If the top rolls are solid, be very particular that they are of the same diameter. This is often the source of much annoyance and irregular work. If the front rolls are shells, the diameter will not make so much difference, and in this respect, they are preferable. But particular care must be taken of oiling the arbors, and cleaning them.

The next thing—and one of the most important—is to look after the weighing, and to this in a great measure is due the quality of the production. The saddles ought to be of a good pattern, and the friction reduced to a minimum by keeping the dents on them no larger than serviceable. The stirrups must hang in such a way as not to rub the steel rolls, for rubbing not only wears the stirrup, but causes misplacement of gravity, so also will a crooked stirrup, especially those kinds which pass through the weight.

To work to the best advantage, it is the duty of every carder to take good care of his frames. In order to do this he must have his frames leveled up every time it is necessary. No overseer who works around a speeder can fail to discover whether it is off the level or not. The frames should be thoroughly cleaned, and the steel rolls scoured and lubricated, once a quarter. When the rolls are dried well and put back in place a little piece of good tallow should be put on each bearing. It ought to be seen to, at this time, that the cap bars, especially those in which the front rollers stand, are not worn so that the covered rollers will not stand parallel with the flutes on the steel rolls. The covered rollers ought to be tried to make sure that the leather is tight on them. The traverse guide should be tested with the hand, while the rollers are out, to make sure that it travels far enough. The rails ought to be cleaned and tallowed as often as the rolls, and the spindle and spindle and bobbin gears examined to see that they are properly pitched. The steps should be oiled as often as possible. The compound motion is so sensitive that it must be kept running freely, because its regularity secures a more even drag on the roving, and produces more quantity and a better quality.

Look out for undue friction on the rail slides, and balance the weight pulleys. Be careful that the rack is well oiled and runs easily. Make the bobbins as large as possible, and see that the builder is not running too wide, and leaving a space between the winds on the bobbins. In this case the frame will be hard to temper, and a man cannot get so much on the bobbins.

There is so much time spent in doffing that it pays to look after the small things. I know that we cannot always look after our frames as we would like to, but nevertheless we can do our best—and if we do that, we will succeed all right.

Experience (Conn.)

An Old-Timer Says—

(*Continued from page* 381.)

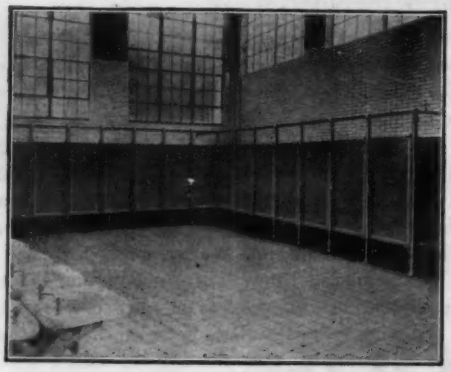
Monday	80x80	400	72x76	300
Tuesday		400		300
Wednesday		400		300
Thursday		400		300
Friday		400		300
Saturday		200		150
		2200		1650

The cloth room reports that we have woven 70400 yards of 80x80 and 59400 yards of 72x76. What percentage of production did our looms produce?

70400 (80x80) yards ÷ 2200 looms = 32 yards per day of ten hours. 33.3 yards is 100 per cent for ten hours on 80x80, therefore

$$\frac{32 \times 100}{33.3} = 96 \text{ per cent production.}$$

59400 (72x76) yards ÷ 1650 looms = 36 yards per day



For the Pittsburg Seamless Tube Co., Beaver Falls, Pa.

Good Appearance in Toilets

No. 3 of a series on "How to Judge Metal Partitions"

MOST textile mill owners believe that a sanitary, good-looking toilet room is a credit to any building. They consider the value of *appearance* in the selection of their toilet partitions. That's why so many of them pick Sanymetal. Attention to the details of design, as well as strength and sanitation, has made Sanymetal a really attractive partition. Take for example the new Sanymetal toilet door. It is built with a one-piece wide stile and pleasing drawn mold all around the panel. It adds that finished touch not found in "made-to-sell-at-a-price" partitions. Yet Sanymetal costs no more than any other good partition.

Other Sanymetal features are: unusually rigid installation, exclusive use of Armco Ingot Iron Sheets, high-grade baked enamel finish, sanitary water-shedding base shoe, slant-lip partition mold, patented Sanymetal Gravity Hinges, electro-zinc rust-proofing of all hardware, unit section design, with or without doors, adaptable to any arrangement. Sanymetal is also made for urinals, shower and dressing-rooms, and toilet wainscot. Write today for Catalog No. 5.

Makers of Sanymetal Office and Factory Partitions

Detail of Sanymetal Door Stile

THE SANYMETAL PRODUCTS CO.
986 E. 64th Street **Cleveland, O.**

Sanymetal
TRADE MARK U.S.REG.
Toilet and Office Partitions

Better Work for Less Money

The Termaco Cleans 36,000 Roving Bobbins Daily Without Cutting or Splintering a Single Bobbin.

The only thing cut by the Termaco is the mill's pay roll. Instead of cutting off the waste, it cards off the waste.

All roving bobbins of 12 inches or less in overall length are cleaned as steadily as a clock ticks off the seconds. Human hands cannot work so rapidly, cannot clean bobbins so thoroughly.

It is a simple matter to feed bobbins to the machine. There are no exposed gears to catch hold of clothing or any unguarded parts that can cause injury to even a careless operator.

After cleaning, the bobbins are dropped out of a rear chute into any handy receiver. Waste is blown by a fan into a big receiving chamber in the base of the machine, from where it is easily removed.

All gears are cut gears. Ball bearings are used on all high speed shafting. All parts are interchangeable. The Termaco is built throughout to give satisfactory, continuous service.

The mill with a Termaco installation substantially lowers both the cost of cleaning roving bobbins and the annual cost of bobbins, and does not have production delays caused by waiting on the hand cleaning of bobbins.

Write our Engineering Department for complete details regarding the worthwhile savings your mill can effect through a Termaco installation.

TERMACO

Every machine, trade marked "Termaco," is sold under a binding guarantee as to workmanship, material and operation.

THE TERRELL MACHINE CO.

(Incorporated)

Engineering Department Charlotte, N. C.

General Supply Co., Danielson, Conn., Representative for N. Y. & N. E.

of ten hours. 35.1 yards is 100 per cent on 72x76, therefore

$$\frac{36 \times 100}{35.1} = 102.5 \text{ per cent production.}$$

But we cannot get the average production for the room by adding 96 per cent and 102.5 per cent together and dividing by 2. 96 + 102.5 divided by 2 would give 99.25 per cent, which is wrong.

You see, Jim, if you were to buy four apples at 10 cents each, you know you would pay out 40 cents. Then if you buy ten more apples at two cents each you know you would pay out 20 cents more, and that would make 60 cents in all you would pay out for apples. But you can't get the average price of those apples by adding two cents and ten cents together and dividing by 2. You see that would be two cents + ten cents = 12 ÷ 2 = six cents. Well, you know you bought 12 apples, then if you multiply by six cents as an average price per apple it would show that you had paid out (six cents × 14 apples) = 84 cents, and you know you paid out only 60 cents. The correct way to get the average price of the apples is, of course, this way

10	apples	@	2 cents	=	20
4	apples	@	10 cents	=	40
14					60

$\frac{60}{14}$ = 4.285 per apple. A little over 4¼ instead of 6 cents.

Therefore, all we have to do to get the loom percentage is to substitute looms for apples and percentage for the price paid for each purchase of apples, and then work it out in the same way.

2200	looms	@	96 per cent	=	211200
1650	looms	@	102.5 per cent	=	169125
3850					380325

$\frac{380325}{3850}$ = 98.78 per cent for the room.

I once wrote an article that I could have sold for considerably over one thousand dollars if I would have signed my name to it so that a certain manufacturer could use it as advertising matter. Later it was published in COTTON and any mill man could buy it for $1.00, the subscription price. Do you realize the valuable information you are getting so cheaply?

Some overseers and superintendents remind me of a cow tied out to grass by a little weak rope. If that fool cow would turn her head toward that clover patch and give *one big lunge*, she could break that rope and soon be in clover. But, poor boob, she doesn't seem to know it.

An overseer or a superintendent will remain "little," just as long as he has only a "little" vision.

If you were your own boss, would you raise your own salary? Honest now!

The Fly Frame Twist Problem.

EDITOR COTTON:

I was greatly interested in the letter, "A Fly Frame Twist Problem," written by "S. A. F. (R. I.)," and appearing in the January issue.

We can no more write alike than we can walk and talk alike. When I write a letter for this department, I try to bring out everything original possible; in other words, I try to write differently from the other fellow, never copy nor imitate. To do this, it is necessary to employ criticism to bring out my reserve margin. So when I wrote the letter referred to by "S. A. F.," he was farthest from my mind; his initials were used only as a reference.

If I have been misunderstood by or have given offense to any reader of this department, I sincerely regret it. I love COTTON because it gives everyone a square deal. My heart and soul are in this journal; since 1913 I have been a contributor to its columns.

I think "S. A. F." must admit, after reading his letter in the August issue, that the editorial force of COTTON did not mis-name his remarks. As regards an 18-ounce lap, it is useless to waste any more space on the subject. Like "S. A. F.," most of the long draft boys would be ashamed to admit that an 18-ounce lap is best for the production of an even strong yarn. I always suspected that "S. A. F." was too much of a practical man to use an 18-ounce lap for a high-grade yarn, and I am glad to have his fuller explanation.

When I made the remark, "Watch out for thick and thin places, and look out for holes," it was in a joking spirit to show that it was trite to claim that a perfect or nearly perfect lap could not be made with such a light sheet. I want to repeat here that a 9-ounce sheet of lap can be made without thin places or holes. An 18-ounce lap will not only wear the licker-in, but will also cause another evil, but this can wait until I hear from another long draft advocate.

To save space, I am not repeating what "S. A. F." said in the ninth paragraph of his letter in January, but let him make the following test, then he may understand: Twist two strings together for two or three yards. Count the turns to the inch. Next, remove the front top leather roll and also the second top leather roll from any fly frame or any spinning frame. Place the end of the twisted strings under the back leather top roll. Have someone hold this end so as to not allow any twist to escape from the twisted portion having passed the action of the rolls.

When the frame is started, untwist the twisted portion in the back of the rolls as quickly as possible. If a turn to the inch or more twist exists in the two twisted strands, the drawing rolls will draw a certain amount that is twisted. As you untwist, you will find that as the twist loses, the convolutions will work to the end held at the back of the frame. So it is the same with the twist lost at the presser pad. A certain amount is lost, but the winding-on is faster, and of course the strand is wound on the bobbin with a twist slightly less than the figured twist.

Efficiency: The efficiency of a machine is the ratio of the useful work to the total work, that is, to the energy exerted. Shut off the steam from any stationary engine, and the fly wheel will run a good many revolutions after the steam is shut off. That is mechanical efficiency. Where does it go? Goes to waste. The same reasoning applies

Attractive Opportunity for Live Sales Agents.

KNAPP FENCE

Easy to Install Wire Partitions

The extreme ease with which they can be erected, moved, changed to suit varying conditions and adjusted to space requirements explains the ever increasing demand for

Knapp Standard Wire Partitions

All that is required for installation is a wrench. No fitting, cutting, drilling or extra material needed. You simply put the partitions together.

Let Us Save You Money on Window Guards, Skylight Guards, Factory Guards, Factory Fence, Factory Gates, Etc.

A few of the merits of Knapp Standard Wire Partitions:

(1) Prevent loitering; (2) stock always visible; (3) stock always protected; (4) fire proof; (5) sanitary; (6) lets in light and air; (7) strong, rigid, practical.

Standard panels include gravity or swing doors, wickets, etc. Ready to ship to you—ready to erect.

Let us have your inquiry for full information.

Send sketch or dimension when writing.

The Knapp Fence Co.

E. 134th St. Cleveland, Ohio

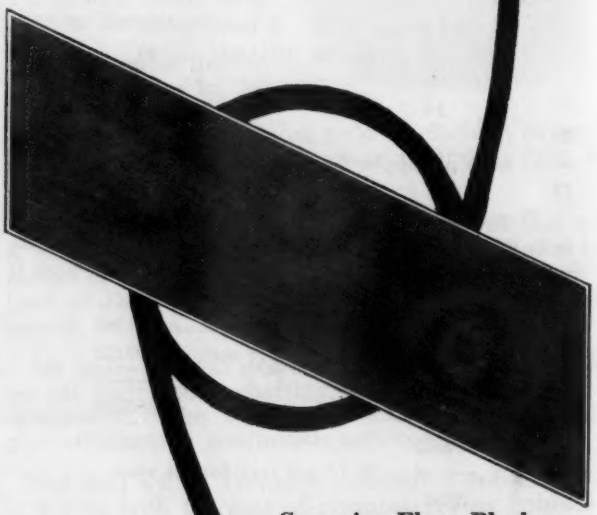
"Timber penetrated by Creosote Oil will never rot"

From Bulletin 14 of the National Department of Agriculture.

Genuine Creo-pine, vacuum and pressure creosoted subflooring will outlast your factory—yet it costs no more than any first-class untreated subflooring.

Affords uninterrupted production, eliminates floor repair costs and assures stability of top floor.

Our modern creosoting plant, big production machinery, together with our special facilities for obtaining highest grade raw lumber at close range hauls, enables us to offer Creo-pine subflooring at very reasonable prices.



Write today for descriptive literature.

Creo-pine Floor Blocks
Creo-pine Shingles
Creo-pine Fence Posts
Creo-pine Conduits
Creo-pine Cross Arms
R. R. Cross Ties
Bridge Timbers
Poles

Creo-pine Sub-Flooring

Manufactured exclusively by

SOUTHERN WOOD PRESERVING CO.

ATLANTA, GEORGIA—Station I

to the strand. The lost twist goes to waste.

"S. A. F." is dead right in the 14th paragraph. There is always a certain drag or tension or draft between the front roll and the bobbin. But "S. A. F." should have stated also, on all bobbin-lead frames. He is dead right also in the 15th paragraph, but oh my! what a slap this is to the bobbin-lead fly frame.

He is dead right in the 16th paragraph.

In answer to the questions in paragraph 17, I will say that a strand of 102 inches wound on a bobbin and having passed through a flyer making 100 revolutions while the above amount is wound, would have .98039 turn to the inch. However, from the amount should be deducted the fraction of a turn lost at the presser pad. The total turns would be $.98039 \times 102 = 99.99978$. From this amount deduct the fraction lost for every inch having passed the action of the presser pad.

I never try to get the best of any contributor when I write, but instead I try to justly criticize every contributor and at the same time give the best there is in me for our mutual benefit. Wash (R. I.)

Variations in the Carding Department.

EDITOR COTTON:

In answer to "Nemo (Ga.)," who asked in December COTTON about variations in the carding department, let me give our variations in terms of per cent, average from a month's run. We spin 40s and 50s and manufacture ginghams, and our variations for the period indicated were as follows:

Pickers	.04	per cent variation per lap.
Cards	.10	per cent variation per yard.
Combers	.05	per cent variation per yard.
Drawing	.02	per cent variation per yard.
Slubbers	.04	per cent variation per number.
Intermediates	.035	per cent variation per number.
Fly Frames	.035	per cent variation per number.
Jack Frames	.03	per cent variation per number.
Spinning	.015	per cent variation per number.

Breaking strength is very near standard.

Our pickers are run with an allowance of 1½ pounds either way from standard. We have been running them that way for some months and as yet I have failed to notice any great difference in the evenness of the work. I might say that every process in our carding department is sized daily, so we are well able to watch the variations in the work. However, we do not attempt to catch light or heavy work until it reaches the first process of drawing; we use two processes.

At present we are using a Crighton opener and three processes of picking. The opener takes out about five per cent of the total number of pounds run through it. The waste is practically all seed, leaf and sand. The breakers take out one per cent, this being all sand and seed. The other two processes take out about four per cent each. Their waste has some good cotton, but consists mostly of leaf.

The cards vary in the per cent waste they take out, ranging from 6.5 to 9.5 per cent, which includes fly, licker-in, strips, etc.

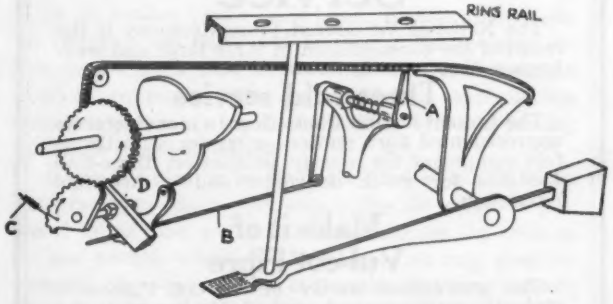
On combers we take the percentage of waste every week, allowing one per cent either way from standard.

I would like to hear what results different mills are having by using their Crighton openers in tandem, and their percentage of waste. What standards have other mills in the carding department, and how closely do they adhere to them? Gen (Mass.)

A New Bunch Builder.

A new type of bunch builder has been invented by H. H. Holcomb, 128 North 37th St., Birmingham, Ala., who has applied for patent on the device. The principle of this device in building the bunch is the interruption of the traverse by disengaging the builder arm from the builder cam sufficiently to form the desired bunch on the bobbin.

When starting to wind a builder rack, as the ring rail is brought downward, the bevel stand trips the arm A in the accompanying illustration, which, through the bearing and crank arm shown, retracts the latch B and allows the spring C to draw the segmental gear into mesh with the gear D. As long as these gears are in mesh, the teeth on the segmental gear, with the exception of several extra teeth at the spring end of the segment, being struck on



the same center, will hold the builder rack in the same position, notwithstanding that the builder cam has left the pitman stand. This gives the requisite interval of rest to the builder rack to permit the winding of a bunch on the feeler wood of the bobbin. At the completion of this, which is controlled by the extent of the arc of the segmental gear, the extra teeth mentioned, which are made to curve in sharply toward the axis of the gear and are struck on a decreasing radius, permit the builder rack to gradually rise until the pitman stand again engages the builder cam, and the main winding proceeds from this point. When the gear D releases the segmental gear the latch pin will be in position to engage and hold it against the action of the spring, since the bevel stand will have been moved to the right by the counter weight and the trip arm A will follow it under pressure of the coil spring on its shaft. The spring holding the segment gear is so connected that when this gear has completed its mesh with the gear D and moved into engagement with the latch, the spring will have moved past dead center and will stand in position to swing the segment gear back into mesh with the gear D upon the retraction of the latch pin. Upon the next operation the latch will again be released as described and the spring will throw the gears back into mesh.

A slight play is given to the builder rack, to wind the most satisfactory bunch on the bobbin, by constructing the segmental gear with groups of deep teeth alternating with a shallow tooth, which gives the necessary slight rise and

MILLS AT
MONTICELLO GA.
AND TOECANE, N.C.

JORDAN
MANUFACTURING COMPANY
BOBBINS

MONTICELLO, GEORGIA

An unusual
Equipment
for an unusual
Service

The National Vulcanized Fibre Company is the result of the consolidation of three large and well-known fibre manufactories.

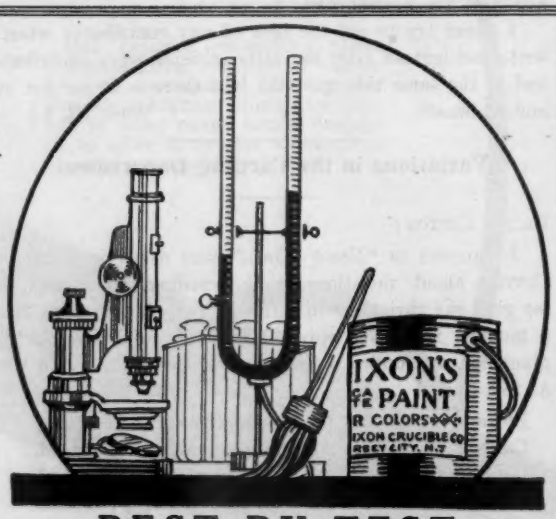
Three-fold service

The present organization offers to manufacturers unprecedented fibre service—a service with three-fold equipment for speedy production, three-fold facilities for quick deliveries and a three-fold reputation.

Make it of
Vul-cot Fibre

The guaranteed purity of Vul-cot Fibre—its strength, toughness and work-ability has made it a part of the products of a host of well-known manufacturers. If there is a place for fibre in your product—either in a very minor or very important position—this unusual experience in the manufacture of all sorts of fibre articles and parts, this unusual service is at your command.

National Vulcanized Fibre Co.
Wilmington, Delaware



BEST BY TEST

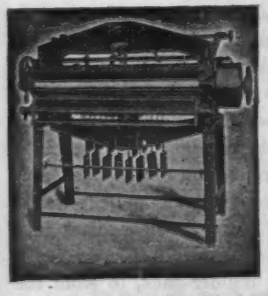
Not only by chemical test but the test of time which, after all, is the only true test

DIXON'S SILICA-GRAPHITE PAINT

stands forth as the long service paint.
It is composed of a natural combination of flake graphite and silica for the pigment and for the vehicle pure boiled linseed oil. Because of this pigment, Dixon's Silica-Graphite Paint has no equal in keeping moisture, gases and corrosion away from metal. Metal surfaces painted with it last longer than when other paints are used. The result is that per year of service Dixon's is the longest lasting and most economical.

Write for Booklet No. 34-B and long service records.

Joseph Dixon Crucible Company
Jersey City New Jersey
Established 1827



50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES

have been added to the "1917" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from each bolt of cloth.

It cuts the corners of expenses in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "U."

"ATLANTA"
HARNESS
"Quality and Service
That Satisfies"

ATLANTA HARNESS
& REED MFG. CO.
ATLANTA, GA.
P. O. Box 1375
Telephone Main 0517

fall to the builder rack for winding a tight bunch.

Mr. Holcomb points out that the bearing stand supporting the trip arm A is preferably fastened to the first sampson next to the head on the gear end of the spinning frame. He further states that it is immaterial what the position of the builder cam may be when the rack is released for engagement therewith after the formation of the bunch. By changing the standard gear on the spinning frame, the inventor further declares, the number of yards of thread in the bunch may be varied from three to twenty yards, as desired. Moreover, he says, the bunch will trip automatically both ways and the operator does not have to set it at any time.

The Avondale Mills, Birmingham, Ala., on high-grade chambrays, are fully equipped with this device, states Mr. Holcomb, who is overseer of spinning at that plant, and are highly pleased with the results secured.

Replies to the Questionnaire.

EDITOR COTTON:

The questionnaire on carding and spinning prepared by the Textile Operating Executives of Georgia, and published on page 235 of the January number of COTTON, appealed to me, and in accordance with your invitation to your readers to answer the questions, I am going to give my views on some of them.

As some of the questions on opening do not apply to my conditions, I shall answer only those that do apply. First, in reply to question 2, as to the method of opening, I have found that the bale breaker and distributor on 1⅛-inch cotton for 28s yarn give good results and enables me to keep very good numbers.

Answering question 10 under opening, the mixing of roving and stick waste for best results is a very serious problem and requires a good deal of experimenting. I have tried the mixing of the waste on an open mix by distributing a given amount to every ten bales and the results were very good. But when using the bale breaker it is hard to get the operative tending this machine to mix the waste as directed, his idea seeming to be to get it run up as quickly as possible without consideration of the equal distribution. Another good method is having an auxiliary hopper attached to the bale breaker and the speed regulated to feed any given percentage of waste to the raw cotton in the hopper of the breaker. The one objection to both of these is that the waste is distributed in both warp and filling, providing they are both made from the same staple.

Another method and one I have found to give better results is to run all waste into a breaker lap; run three of these on the intermediate picker with one of good cotton, mark them so they will be known, and mix one to three good laps on the finisher picker and run at cards. The best method is to proceed as above through the intermediate picker, mark them special, set aside two or more cards as needed to handle these laps, reduce the doffer speed, have the cards spread out around the room so that no two cards are liable to feed to the same drawing frame, feed these to the drawing frames one to six, and at the last process it is practically impossible to detect the waste. It would be much better to mix this at the drawing frames that are making filling yarn.

My opinion, replying to opening question 11, is that it is not advisable to use humidifiers at or near the pickers. At this process any amount of moisture has a tendency to cause the fibers to stick together and on parts of the machines. This may in itself be somewhat overcome, but the laps which are to be fed to the card should be very dry as any moisture here has a tendency to rust and damage the card clothing and when this is done the wires break out and the result is poor carding.

PICKERS.

Question 1. I find that three processes of picking give the best results. Two-process picking will enable one to take out quite a good amount of dirt, but when compared to the amount taken out in three processes, and the resultant evenness through picker doubling, I say "three processes."

Question 2. As to kinds of beaters, I use the porcupine beater on the opener, because of the matted form of the cotton at this point, the prongs of the cylinder not being in direct line with each other have a tendency to pass through the mass and loosen it without the same amount of injury to the individual fibers as the sharp blow from a bladed beater.

In the breaker I use a blade beater, because at this point the cotton is less bulky and because of the necessity for striking the quick blow to loosen the dirt at the earliest point in processing. This may appear to contradict the statement previously made, but I think a second reading will make it appear clearer.

I have the carding beater in the finisher, as this is the last process to remove dirt, etc., before the cotton is presented to the card, and it is advisable to put the fibers in the best possible condition. This beater not only gives the necessary blows per inch but at the same time gives a combing action which tends to loosen the dirt and leaf better.

Question 5. As to beater settings, I find that ¼-inch is close enough for good results. Because of the amount of cotton that is between the surface of the feed roll and the beater blade, if these were too close the fibers would be ruptured by the crowding at this point.

Question 6. Ball bearings on the apron are a great help to the evener motion, by the more positive motion given to the apron, this doing away with the slippage at this point, causing a more even amount of cotton to be presented to the beater, with less variation in the speed of the feed rolls, this requiring less changing of position of the cone belt.

Question 7. Yes, the evener motions on my pickers are so adjusted as to make the necessary compensation with only three laps on the apron as would be the case with four laps on. This enables the evener belt to ship an equal distance on either side of the center. I would not advise running this long, nor telling the operative that this might be done with no harm, as he may possibly try it in order to reduce his work.

Question 8. It is not necessary to have separate pipes from the exhaust fans to the dust chamber, providing the main pipes are large enough to handle the amount of exhaust from the pickers tied to them, and that the curves are in circles of a large radius.

Question 9. The greatest cause of split laps is waste in too great quantities, in this case the equal distribution. Another cause is incorrect drafts in the picker, these may be caused by misplaced dampers or parts of the screens

BLEACHERS!

Your Selling Agent must cut
prices if your product
is not superior.

Avoid this by giving him
better bleached goods, such
as are permanently white
without weakening and of
greater softness and elasticity.

All this only possible
by Solozone-processing.

Ask us how if you don't know.

THE ROESSLER & HASSLACHER CHEMICAL CO.
New York

being clogged in the machine between the entrance of the air and the screens.

Question 10. As to the proper percentage of variation in finisher lap weights, about one quarter of a pound on either side of the required weight, I should say. This may be kept providing proper care is taken in keeping the evener motion clean and well lubricated.

Question 11. I do not think it is necessary to weigh intermediate laps on this class of work, providing the hoppers are attended to and an equal amount of cotton kept in them at all times.

Question 12. I have explained why I advise against humidifiers in the picker room, in answering the question under opening.

CARDS.

Question 1. I prefer a heavy lap with a slow feed for this reason: With the slow feed it takes longer for the fibers to leave the bite of the feed rolls and allows the passage of more teeth of the licker-in through the cotton; this enables better loosening of the remaining dirt.

Question 2. If I was reducing the carding, I would reduce the speed of the doffer rather than change the weight of lap or of delivered sliver. As the speed of the doffer controls the speed of the feed rolls the reducing of doffer speed feeds less cotton in a given time (this is also true of the two other suggestions) as the speed of the cylinder, licker-in and flats are the same the wire teeth of the card have a better opportunity to handle the fibers and in this way improve the carding. By reducing the doffer speed the relation of draft on the machines is not changed and this avoids quite an amount of trouble. If either of the others were changed the machine drafts at some place must be changed to produce the same counts. This is not always a paying proposition. By making the change in doffer speed it is convenient at any time to increase again without any other trouble than changing one gear on each card.

Question 3. Light grinding is preferable to heavy grinding, because there is not the same tendency to hook the wire. When card clothing is put on it is in workable condition (with the exception of grinding to settle the butting of the fillet) and by light and frequent grinding a very fine point may be kept on the wire.

Question 4. On this cotton I am using, setting the licker-in to the cylinder to a 10 gauge and the feed roll to the licker-in to a 7 gauge, gives me best results.

Question 5. The card draft I have found best is about 105.

Question 6. I have never tried reversing the direction of the card flats.

Question 7. I think compressed air is an evil for the cards and drawing frames, especially as the air causes the lint and dirt to fly and it settles in the webs and offsets some of the work of the machines, also causing trouble at the next process by breakage. For the picker room it is very useful in cleaning parts which become imbedded with dirt and oil. The only time to use compressed air in the card room is when the machines are stopped, and then it needs to have the attention and time of somebody to follow up and pick off all particles which adhere to the sliver and roving.

Question 8. I find the best speed for the licker-in is a surface speed of about 12,000 inches per minute.

Question 9. No, it does not injure the staple to set the licker-in to a gauge 7 on 1-inch stock, as the shape of the

feed plate and the bite of the feed roll are such that the bite is further away than the length of the staple.

DRAWING.

Question 1. Six doublings are used, being better to overcome any irregularities in the strands.

Question 2. Three processes of drawing are giving best results, because of increased breaking strength and more evenness of the numbers, evenness and strength being caused by the extra doublings first and by the better laying of the fibers parallel enabling them to take the twist better.

Question 3. We run the front roll on drawing at 450 r. p. m. I consider 375 to 400 r. p. m. better, but circumstances require present speed.

Question 4. I consider a draft near the number of doublings best on drawing frames.

FLY FRAMES.

Question 1. Following are my drafts: Slubber draft 3.40; intermediate, 5.70; roving frame, 6.90. This draft being conservative does not over-draw the stock and when it reaches the spinning frame it is in good condition to stand the drawing.

Question 2. The best place to keep numbers is in the picker room; by so doing the changing at the succeeding processes is greatly reduced. The changing at the roving frames should be as little as possible, and this may be arranged by closely following the weight of finisher picker laps and sizing at the finisher drawing frames and making the change here if necessary.

Question 3. Have not tried this.

SPINNING.

Question 1. For 28s yarn, a draft of 12 to 13 will run very well for double roving. For single roving it is not advisable to go higher than 9 draft.

Question 2. This query, regarding the twist for securing the best breaking strength, is hard to answer because there are seasons when the run of cotton is poor and it is necessary to run twist higher than standard. Under ordinary conditions, with a fair run of cotton, a better breaking strength may be obtained by running with three or four teeth less than standard twist.

Question 3. From the weaving standpoint, running the traverse up slow proves much better, there being no tendency of a double thread being run in the pick, there is a better binding of the yarn at the nose with the quick traverse down. It must be remembered that this all may be offset by having a dwell of the rail at the nose. As far as the spinning is concerned I have noticed no difference in the running.

Question 4. The evenness and strength of double roving over single is noticeable, but strength not to so great an extent as evenness.

Question 5. I much prefer the No. 1 flange ring over the No. 2 flange ring. The reason being that the number of travelers used is very much less, due to the reason of the traveler being stronger that is used on the No. 1 flange. This is caused by the use of a smaller circle but having the same weight of traveler.

Question 6. I prefer tape drive for various reasons—one being that the life of tape is longer than that of the band—the twist is more uniform due to the tension device used keeping good tension at all times. As the twist is more uniform the frames may be run with less twist and get good results.

Question 7. Have not tried this.

Question 8. I do not consider it expensive to plumb spindles and level frames once a year, providing a reliable person does the work. By having this done each year all spindles and frames are kept producing at their utmost capacity, thereby reducing the cost per pound. By having this work done each year the length of time required is not so great, because there are fewer spindles and frames that need touching and the extra few dollars that are spent are soon paid for by the extra production due to the greater number of spindles producing at efficiency.

Question 9. Yes, when plumbing spindles I level the ring rails cross-ways as well as length-ways, by means of a spirit level and the rail lifting rods.

Question 10. About 2¼ inches is a good distance, for my work, to set the guide wires from the top of the spindles.

Question 11. My bands are about ⅛-inch diameter, made of roving. Whirls ¾-inch diameter. Twist in roving about 6.75, twist in band finished, 6. 70 bands per pound.

Question 12. I use mineral oil for lubricating lifting rods.

Question 13. In my opinion it is better to change a certain number of travelers each day as in this way I consider it easier to keep the work running best. Sometimes by having a special day set something unforeseen arises and it is not possible to make any changes on that day and it often follows that the changes will be skipped this time, and this is detrimental to the best work.

Question 14. The exact amount of increase in production of filling build over warp build will vary according to different mills. In ordinary cases the increase is made by being able to run with less twist using this wind. Also as the bobbin does not need to be pulled around as the yarn is drawn off the diameter may be increased to the size of the largest ring advisable to run on these counts. This eliminates doffing and each doff thus saved means this amount of time producing yarn. Also the length of time it takes a spinner to make a piecing, due to an end breaking, is less, thus putting more yarn on these bobbins. The spinner's time is saved by her being able to find the broken end on the bobbin more readily. It has been found that the same breaking strength may be obtained by changing to two teeth less twist.

Question 15. Yarn should not be sized at the humidity in which it is spun. Yarn should be sized as near the humidity it is to be spooled and warped, as this is the place where the breakages are noticed mostly. If tested at this humidity, it will be more correct. During spinning there is a great amount of heat created by the speed of the spindles and this causes evaporation and leaves the yarn drier than when it left the creels, and to my mind does not give the correct break. Although if we place our break at this point the strength at the succeeding machines must be greater as the yarn will absorb moisture after leaving the spinning frame.

Question 16. As to what causes one end of a shell roll to become fluted, I think sometimes the burning has been done improperly and allows a slack end, that is the leather cot not holding the flannel properly.

Question 17. The warper drum should be run forward on the warper for best results. With the drum running in this way it allows the beam to run backward and the yarn runs under instead of over the beam. When an end breaks the warper tender does not need to spread the yarn to find the missing end. This spreading of the yarn has a ten-

DIRECT COTTON COLORS

CENTRAL DYESTUFF & CHEMICAL CO.

MAIN OFFICE AND WORKS: NEWARK, N. J.

ESTABLISHED 1898

COTTON MILLS SHOULD USE Commercial Acetylene For Welding

Supplied in portable cylinders on loan basis without deposit.

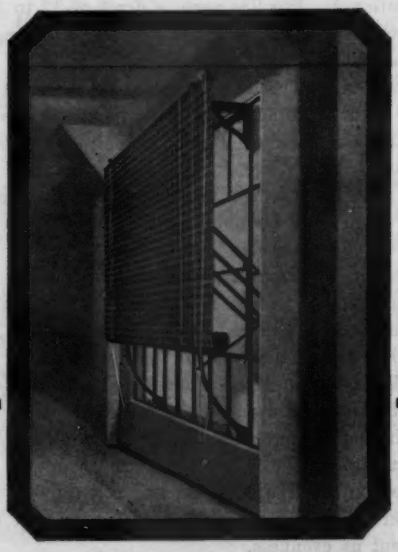
Only the purest gas can safely be trusted to meet the exacting demands for cotton mill welding repairs. Commercial Acetylene is a gas of absolute purity.

WRITE FOR OUR SERVICE AGREEMENT

Commercial Acetylene Supply Co.

204 Trust Company of Georgia Bldg., Atlanta, Ga.
Main Office: 30 Broadway, New York City
203 S. LaSalle St., Chicago

Aurora, Ill. East Deerfield, Mass. Boston, Mass. Toronto, Ont. Moberly, Mo. Bound Brook, N. J. San Francisco, Cal. Berkeley, Cal.



RA-TOX

Wood Fabric

VENTILATING WINDOW SHADES

30% to 40% more light and air—all blinding heat and glare excluded.

Apply Ra-Tox Shades to any sash. Write for complete information.

HOUGH SHADE CORPORATION

Industrial Shade Division

300 Mills Street Janesville, Wis.

dency to enlarge that portion of the beam and at the next process will result in slack and tight ends running, which sometimes cause unnecessary hitch backs due to the tight ends snapping.

I do not expect these remarks to be agreeable to everybody. Perhaps after they have been read, the readers will make remarks and suggestions and enable me to make corrections. If it were possible for me or anyone else to lay out the proper arrangements for a mill the interest would soon die out. It is the difference of opinion that makes this work of interest and value and spurs the next man on. I hope the day will not come when I accept without question everything that is suggested in connection with cotton manufacturing.

We often hear of a man going to a new position and greatly improving conditions for help and for running, and it is believed that the goal has been reached, but he moves on, another succeeds him and finds many ways to improve what was considered ideal. This is what must be expected because of no two persons looking at a thing from the same point of view. Carder (Mass.)

Some Comments on the Anniston Meeting.

EDITOR COTTON:

I enjoyed reading the report of the Carders' Division of the Southern Textile Association, at Anniston, Ala., on December 8th, which appeared in the January number of COTTON. Every speaker should receive the highest commendation.

After reading every word of every discussion, the feeling stole over me to pat myself on the back, for most every speaker upheld practically every one of my arguments that have appeared in this department for the past ten years.

Not one voice was raised against the Crighton opener. However, there is one point that was not settled at the meeting, and that was in regard to the perforated screen or grid bars doing the better cleaning. In all my mill experience, I find no comparison between the two. With the grid bars you get the right action, that is, you have a vertical space from the top to the bottom of the bars. The action is similar to that of the mote knives. The perforated screen I find useless except in the case of a high-grade, clean stock.

I see in the report that David Clark, of Charlotte, states "I just want to recall that there is no such thing as five per cent variation in yarn numbers. There has been nobody yet who has found a variation of less than five numbers, most of them are nearer ten numbers."

Now granting that Mr. Clark is right, at the next meeting the following should be discussed—and I hope that Chairman Burnham will please take this up and put it before the members—If we have a variation of ten numbers where is the cause of the variation? How much of a variation is found on the finished drawing?

In all my mill experience, I have never found a variation exceeding three grains in the finished drawing sliver. If a variation of only three grains is found at the finished drawing sliver, a variation of only three numbers will be found in the yarn.

Then the trouble is in the fly frames, and only substantiates what I have argued continually about the fly frame being the most imperfect machine in our cotton mills. For instance let us study the experience related by Mr. Rennie on pages 184 and 185 in the report. The young expert found the trouble to be speed. Why? Because this young man had been properly trained by a practical man. He knew that the high speed changed the relationship of the flyers and the outline of the cones. He knew that a rack gear would not remedy those unequal conditions. So he reduced the speed in the neighborhood of that for which the cones were modified, and the frames ran from set to set.

Mr. Burnham could never have given better advice than when he said, "I believe we would all do well to look into the question of spindle speeds on all fly frames."

Mr. Edwards hit the nail on the head when he said, "If it took you just a little longer to make a doff than it did before the result is that you have less ends to put up."

Think of what this means. What Mr. Edwards states knocks out the argument that it is necessary to pay the help a higher wage to get the cream of the help. I believe, as does Mr. Edwards, that if a man has the work running well he is master of the situation; on the other hand, no matter how much he pays per hank, if the work is running badly continually, the help are bound to give way under the strain, which means a feeling of resentment which surely in most cases results in a change.

I cannot agree with Robert Huskey when he says in his paper read before the meeting, "Another thing I want to speak of is the cone belt. I notice in some textile papers that belt dressing is prescribed for the cone belt. This should never be allowed, for it will cause the roving to be stretched, besides other bad results when the dressing is first applied. The attendant will have trouble when winding the cone belt back at doff time, because it is not necessary to put belt dressing on a cone belt, regardless of the load it carries."

When a pair of cones are modified, the slippage of the cone belt is one factor that must be considered. No practical man will claim that a cone belt does not slip. The friction between the cones and cone belt is similar to the frictional contact between the front steel roll and the top leather roll. Therefore, if you do not use any dressing on the cone belt, the belt will slip more, and this means a a slack tension. The tender will have the contact gear changed, and then it all depends on the weather as to whether or not the work will run well.

Every morning for the past thirty years, and when I say every morning I do not mean once a week, I have dressed or had dressed my cone belts. It takes only a few minutes and takes very little belt dressing, and by using belt dressing the belt will hold the same position and with the proper rack gear a better tension will be secured. But you will get stretch just as long as you have the bobbin-lead frame.

However, Mr. Huskey gives us a good point when he tells us about the one-inch cone belt with a two-inch rider. The trouble with all fly frames is that in order to carry the heavy load demanded of it, the belt be wide, and the guides are also made wide for its accommodation. A wide belt helps to destroy the fine outlines of the concave and convex cones, so by having only a one-inch belt in contact with the surface of the cones, and a two-inch rider to fill up the space in the guides, the two extremes are destroyed. The writer once used a one-inch rider over a one-inch cone belt, and had other guides cast for the one-inch belt.

When the doublings on the drawing frame are reduced, you are moving in the wrong direction. The variation found

in the card sliver (as brought out at the meeting) should convince the most skeptical on this point. While superintendent of a New York mill, I increased my doublings on the drawing to ten, and this increased the breaking strength of the yarn considerably.

I wish every manufacturer and builder of machinery would read and weigh what Mr. Rennie stated at the meeting as regards the use of a 1⅜-inch roll on drawing frames, found in the report on page 186 of the January issue. It is no secret that mills run ⅞-inch stock. Now the distance between the first and second rolls must be at least 1/16 of an inch. So, add the radius of both rolls to 1/16-inch and see if you can get the proper settings taught in text books and textile schools for this stock. Mr. Rennie deserves a lot of credit, and my hope is that what he states will bear fruit. Wash (R. I.)

Finding the Constant for Production.

EDITOR COTTON:

The following rule is an old one, but is very valuable in many ways for proving the variation in roving and yarn: Divide 12 into as many hundreds as there are yards, and the quotient is the constant dividend. To make it plain, let us assume that we are running speeders having 160 spindles each, and running 4 hank roving. The constant for production would be 160 ÷ 4 = 40. Which means that there is 40 pounds of stock on the 160 bobbins each time the hank clock registers one hank. Proof: 840 yards of one hank will, of course, weigh one pound, so one hank of 4-hank roving will weigh .25 of a pound. 160 × .25 = 40 pounds. .25 = 4 ounces × 437.5 grains = 1,750 grains. 840 ÷ 12 = 7,000 ÷ 1,750 = 4-hank roving.

On the spinning frame, say, we are running 8s yarn on 204 spindles to the frame. 204 ÷ 8 = 25.5 = constant for production.

By weighing the empty bobbins on either the speeder or ring frame, and taking the clock exactly after the fraction of a hank has been registered, the variation in the roving or yarn can be determined, because, it must be admitted there is much variation in reeling. Wash (Mass.)

A Question on Balanced Twist.

EDITOR COTTON:

What is balanced twist? If I put 3.75 × the square root of the number of twist in my 36s yarn, and then put 5.50 × the square root in the ply, will this balance it, or will the yarn kink up in the skeins? I should like to have some of your readers discuss this, going into detail to explain the matter generally and also in connection with my specific problem. M. L. (S. C.)

A Question on Sizing for Yarn Numbers.

EDITOR COTTON:

Which is the better place to do sizing—on the drawing frames or on the slubbers? I have heard this question brought up for discussion a number of times, but it seems to have never been definitely settled, and I shall be glad to have some of your contributors give us their ideas on it.

W. S. B. (N. Y.)

What Makes a Successful Foreman?

EDITOR COTTON:

In discussing "What Makes a Successful Foreman?" in the October issue, "Old Tom" says he has worked up from sweeper to superintendent. I have never gotten to be superintendent, yet, but I have worked up from sweeper to overseer, and I will say that I think "Old Tom" is right in everything he says.

I think all overseers and superintendents should be men who have worked their way up. Don't misunderstand me to say I am against a man with a college education or a man who has been through a textile school. But that man also ought to get the practical part. I worked all the way up to overseer and then I took a textile course. If I had not already had the practical experience I would have known little more than I did before, outside of the mathematics. Get it by digging down after it and then you will know more about how to go after the other fellow when it becomes necessary to do so.

An operating executive must consider the feeling of the fellow under him if he wants respect and cooperation, without which he will be a failure. Such a man should always take time to go over his orders to make them plain and clear. To my way of thinking, he should see what he sees and correct it before it gets too far gone to correct without trouble. He should study his help, their methods; he should not go after them with full force at first, but should give them a fair trial and then if they will not do right discharge them and let them go.

To make a success a man should get on the job early and stay on it until quitting time; take pride in his job, with a determination to give the best there is in him; go straight in dealing with all who come under his charge and tell them he is expecting them to go straight with him; never make any promises he doesn't think he can fulfill; and never be afraid to go to a man, but go in the right way.

Bab (N. C.)

Twist On the Spinning Frame.

EDITOR COTTON:

On a spinning frame, does the twist come out of the roving in drafting between the rolls? If so, where does it go?

What is the best twist to use on a fly frame, under average conditions, for an average yarn 17s, with 65 per cent humidity and an 8 per cent regain in the spinning room; size of fly frame, 7 x 3½, hank roving, 2.15 to 2.75?

I shall appreciate having some of your readers discuss these questions in the "How Other Men Manage" Department. P. P. (Ga.)

The Passing of the Mule Frame.

EDITOR COTTON:

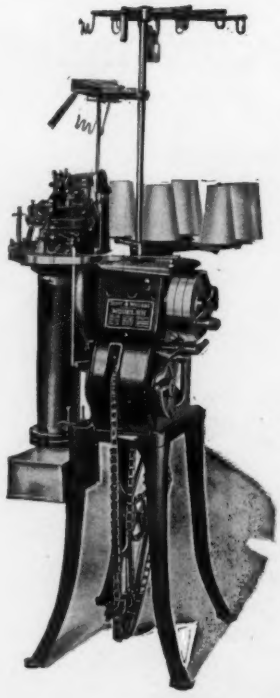
Why is it that mule spinning has been discarded more in the southern states than in New England, and why is it that all along the line the mule frame is now being discarded in favor of the ring spinning frame? I would like to have your readers discuss these questions.

W. F. R. (Pa.)

KNITTING SECTION

NEW MODEL H-H

Producing Ribbed Top Half Hose Complete



Ribbed top made on two sets of needles.
Automatic transfer from ribbed stitch to plain.
Eliminating necessity of skilled help.
Saving of raveling waste which occurs when topped by hand.
Each stocking is dropped from the machine when finished.
Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.
Machine is fitted with five yarn fingers.
Provision is made for high spliced heel and double sole.
Provision is made for ring top and ring toe.
Speed of machine about the same as Model K.
Production about twelve stockings per hour on 3¾" 220 needles.
One operator can take care of the same number of machines as Model K.
The machine is built in all gauges.

ESTABLISHED 1865

SCOTT & WILLIAMS

INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

Charlotte
1006 Realty Building

"We are going to use Universal Winding so make your machinery plans accordingly"

"The Universal proposition is best from all angles; economy, production, and depreciation; minimum floor space, power and flexibility of equipment.

"We're going to plan our dye house for Franklin Process dyeing equipment, too, and of course installing Universal Winding machines now will mean a big saving when we complete that part of the plant.

"Get in touch with the Universal people; they will send an engineer to work with you on these layouts."

There is a Universal machine for every textile winding problem from rope to 200's count, single cotton yarn. But every prospective Universal installation is a separate problem analyzed by a competent Universal Engineer who will gladly submit proof of the economy of Universal Winding before you are asked to spend one cent for equipment.

UNIVERSAL WINDING COMPANY

Providence,
New York,
Chicago,

LEESONA

BOSTON

Philadelphia,
Charlotte,
Utica,

Montreal and Hamilton, Canada

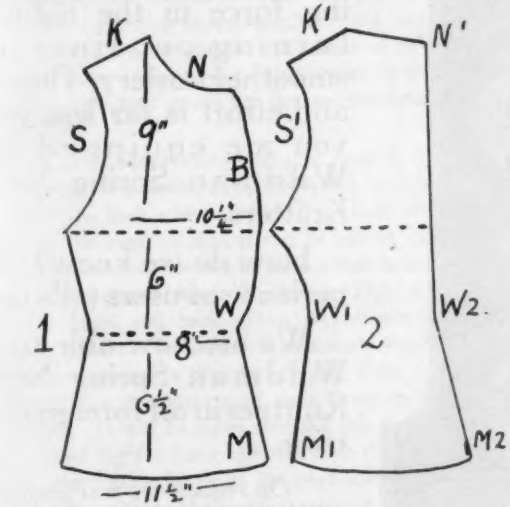
DEPOTS AND OFFICES AT MANCHESTER AND PARIS

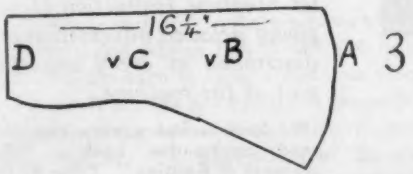
The Manufacture of Cut Underwear

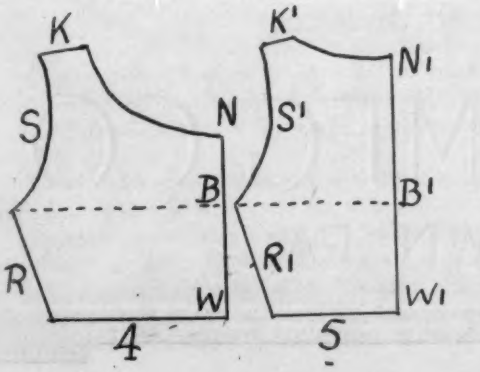
By WILLIAM DAVIS, M. A.

A very considerable trade is done in what may be termed intermediate garments which as the name implies are made to be worn neither next to the skin nor on the outside. These garments are an essential part of ladies' clothing and this trade can best be taken care of by the maker of knitted products. It does not belong to the most expensive type of trade, but is all the more essential to our clothing economy and so a steady demand is guaranteed from season to season. Moreover these articles are capable of improvement in regard to trimming and new styles can always create a demand which is steady and yields a better profit than the ordinary common stock.

Herewith are given several styles which are considered to be standard garments as intermediates and an examination of these shapes and cuts will show the lines on which this trade is carried on. These styles are selected from shapes which are employed by large and successful manufacturers who conduct this branch of the trade on a very large scale of colossal volume. Figs. 1 and 2 combined will produce an intermediate article known by the name of a camisole, spencer or bodice and the web out of which it is cut is worked on a circular web machine about 23 inches in diameter which gives fabric of this width on the double. The set of the machine is 11 needles per inch and the yarn employed for cotton articles is 8s single cotton of a longish staple which can be brushed on the inside to improve the handle, there is also a slight brush on the outside to remove the rawness of the loops and give a better skin to the texture.



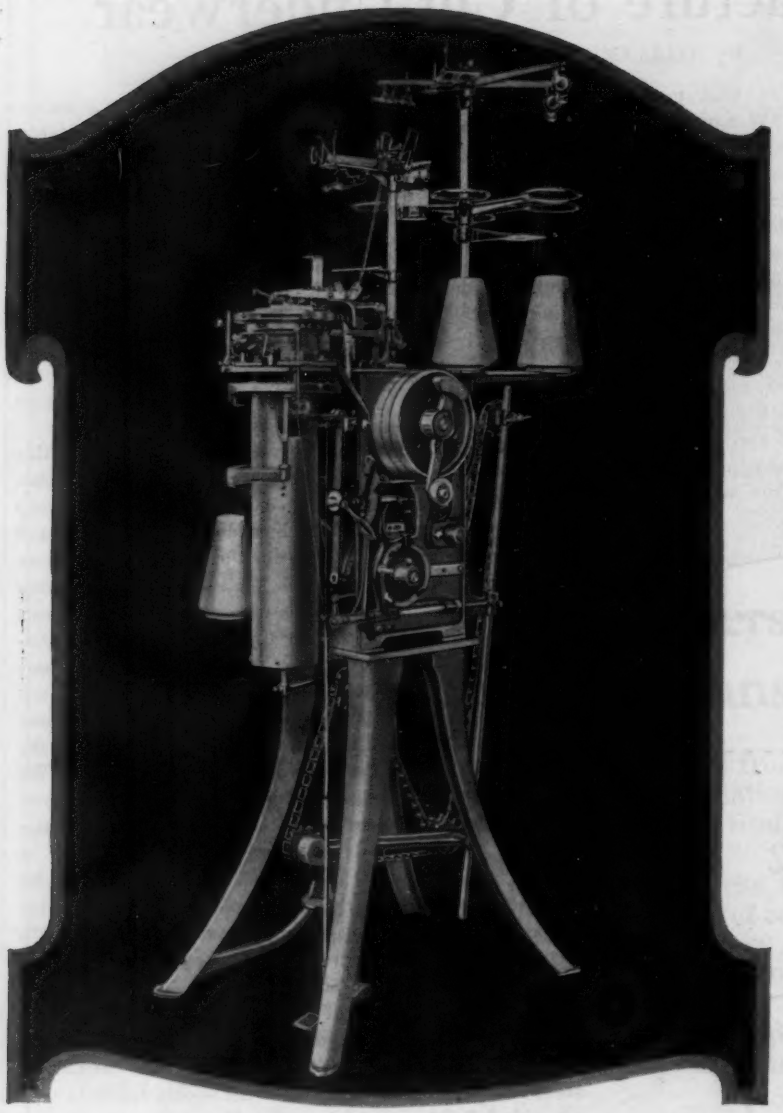




The left section of the two pieces is marked 1 and this is cut out of the double fabric to the width of 11½ inches and the direction is shown by the shape. This is a body garment formed to cover the bust down to the waist and then following on with a part for the seat. These various sections are shown in the sketch, the cut for the neck being shown at N, the bust at B, the sleeve portion at S, from W to M represents the portion approaching the seat. Diagram 2 gives the corresponding shape for the back where several modifications can be noted. The part S1 is exactly similar to the sleeve portions of the left diagram and also the neck K1, and the lower portion W1 M1. On the right side of Fig. 2 the piece is straight from N1 to W2 whereas the corresponding part in Fig. 1 is curved as shown in the diagram. This of course is to allow for the greater width at the bust and the back piece can therefore be straight as less material is required. The neck portion N1 is higher at the back as this is a more general shape, higher at the back than the front except in recent seasons when the vogue for low cut outer dresses made the depth on the back as much as that on the face.

This style is cut out of the double fabric but there are various points which should be mentioned as disadvantages for manufacture with high production. Neither of these two pieces can be cut out of the double fabric to have one side left unseamed because in Fig. 2 the shape comes out of the straight line from W2 to M2, similarly both sides of Fig. 1 are variable in form and the double edge must be cut. This means that four seams would be required for this style of article, one down the front, another down the back and one on either side. This system may be improved so that only three seams are required by making the back part shown in Fig. 2 straight down the right side W2 to M2 and leaving the extra material on the front part in Fig. 1 to give the extra fabric at various points.

In some varieties of this article the raw edge of the sleeve portions is overlocked but in other cases for winter wear, half, three-quarters, or full-length sleeves are added. The shape for these may be seen by examination of Fig. 3 which is cut out of the double fabric having the double edge along the top of the figure as this is noted to be quite straight. The sleeve is seamed in the shape shown with the seam on the underside and a rib part may be attached to the extremity. The sleeve in its full length is 16¼ inches long, the shape shown representing the full length of the part. This shape is readily modified to give a short sleeve, or a three-quarter sleeve by making the shape terminate



WILDMAN
THE WORLD'S STANDARD

Wildman Spring Needle Knitter

Of course, it takes time and effort to get your working force in the habit of turning out finer and smoother hosiery. The time and effort is far less when you are equipped with Wildman Spring Needle Knitters.

How do we know? Experience of users tells us so.

We are now able to sell Wildman Spring Needle Knitters in all foreign countries.

On request we will send the "Wildman Spring Needle Knitter Machine Instruction Book" giving detailed information and description of every important part of the machine.

We have issued a very complete and informative book — "The Science of Knitting." Price $3.00.

TRADE MFG MARK

WILDMAN MFG. CO.
NORRISTOWN, PA.

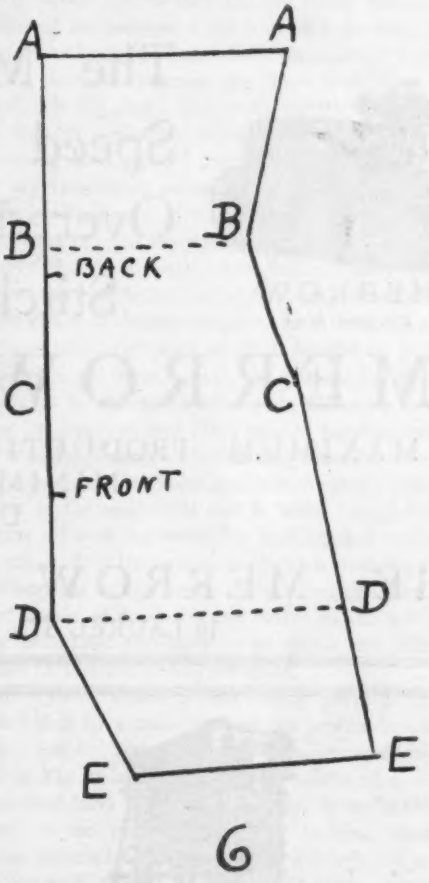
at any of the points shown. From A to B represents the length and shape for the short sleeve which comes just over the shoulder and with the rib attached half way to the elbow. If the length is taken from A to C the sleeve becomes what is known as a three-quarter which extends just below the elbow. The full length (A to D) comes right down to the wrist, but this shape is not generally favored except as styles suitable for old persons unable to take active exercise to keep up the circulation in the blood vessels. The shape of the sleeve at A will be noted to curve outwards to fit the inward curve in Fig. 1 at S and the sleeves are of course equal in width at the point of attachment, the seaming being done generally on the flatlock machine.

An examination of this rather elaborate shape suggests many ways in which the manufacturer can modify and alter it according to size and the fashion at the moment, and the system of manufacture for economical production can also be outlined. The approximate lengths and widths of the pieces are shown, the first being 10¼ inches wide at the bust narrowing in to 8 inches wide at the waist. From the neck to the end of the sleeve opening is shown as 9 inches, from this line to the waist line is given as 6 inches, whilst the remaining basque portion is 6½ inches in length. This gives a total length for this article of 21½ inches and the dimension of the back portion shown in Fig. 2 must, of course, correspond except for the modifications in shape referred to.

The great disadvantage of this style is that you have four seams, one at each quarter which may be reduced to three if the back piece of Fig. 2 is made with a straight edge on the right so that it can be cut on the double. A much simpler modification of style which is more characteristic of the general trade is given in Figs. 4 and 5 which are the front and back pieces respectively of a similar spencer garment for ladies' intermediate wear. These two pieces are similar in their lettering to Figs. 1 and 2 which will enable a comparison of their form to be made with readiness. It will be noted that the left hand shape which is intended for the front is straight so that this can be cut out of the double fabric at the edge and the piece opened out to give a piece the shape for which will comprise the whole front of the article.

Similarly in Fig. 5 we have a piece which is straight on the right hand side so that it can also be cut out of the double at the edge to form a complete piece on the back. The parts R and R1 are exactly to shape in both pieces as well as the neck portions K and K1 which can be seamed together exactly. An examination of the other dimensions will show that the back and front pieces differ in various details. In the front piece of Fig. 4 the neck piece marked N is cut low, whilst the corresponding piece at the back is cut much higher; evidently these lines can be raised or lowered with great facility according to the style required, and particularly according to the style of the outer garments for sufficient must be cut out at the neck to ensure that the article will not be visible when the wearer is fully dressed.

The method of providing the extra width required at the bust will be seen by comparing the widths of the front and back pieces, there being a good two inches difference, which means four inches when the double piece is unfolded. In this case the article extends only to the waist, the length of the piece from K to the bottom of the sleeve hole being 8½ inches, with a further 5½ inches from the bottom of the sleeve to the waist. The sleeve portion in this case is overlocked around the edge, or a half or quarter sleeve is inserted. The chief point in manufacturing these garments is attractive trimming and the neck portions usually receives special attention at the hands of the designer. The raw edge at the bottom is generally secured by overlocking on the sewing or seaming machine.



6

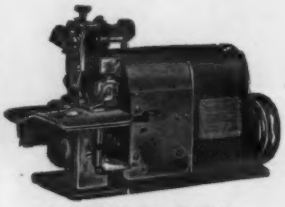
The combination undergarment is always one which appeals to a large and important section of wearers of both sexes, in America the combination or union suit as it is called has won widespread popularity. In Great Britain and continental countries, the ladies' union suit is firmly established as a special branch of the trade but the same cannot be said of the union suit for men who seem to prefer the separate garments of shirt and pants. The respective merits of the two systems may be referred to. In the separate articles the great disadvantage is that they overlap at the center of the body and at the seat, there being two-ply fabric at these points which often render the wearer uncomfortable. This overlapping of extra fabric takes place at a part where the extra material tends to get curled up so as to impede the movements of the limbs at this point and create friction. On the other hand the lower garment usually wears out more quickly than the upper and we may have two pants to wear out one shirt and thus economize somewhat in the cost of underwear.

For men also the union suit, for certain callings, is sometimes considered too rigid in form, particularly when the wearer requires to do a lot of bending during the course of his work. When the garment is in one piece there is a tendency for the article to burst and go into holes earlier

MERROWING

ESTABLISHED 1838

Makers of



MERROW
Reg. Trade Mark

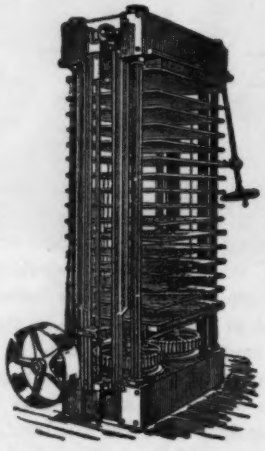
The Merrow High Speed Overseaming Overedging and Shell Stitch Machines.

MERROWISE FOR EFFICIENCY IT MEANS

MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY

16 LAUREL ST., HARTFORD, CONN., U. S. A.



RELIANCE
Hot Plate Screw Press
FOR
Hosiery and Underwear
Write for Catalog and Prices
Reliance Machine Works
FRANKFORD, PHILA.

JOSEPH T. PEARSON & SONS CO.
MANUFACTURERS OF
BONE DRY
HOSIERY FINISHING BOARDS
THAT WORK ABSOLUTELY SMOOTH
PROMPT SERVICE—RIGHT PRICES
1815 E. Boston venue, Philadelphia

GENERAL MACHINE WORKS
YORK, PA.
Manufacturers of
Circular Rib Knitting Machinery
Cylinders and Dials

than it should. Also it is rather more difficult to fit a wearer of abnormal build with the union suit than with separate garments, as you have to cover the whole body to below the knees and this affords opportunity for tightened shape at the shoulders; the length of body or legs and discrepancy in any one of those parts makes itself felt throughout the whole length of the article. On the other hand the points in favor of the union garment are important, it is neater, tidier and more comfortable to wear if the right fit is secured. There is no discomfort at the center of the body and it is rapidly put off and on in one piece. For children's wear the separate articles are a disadvantage as they get curled up quickly, particularly for night wear which articles are best made in the form of union suits.

More than one knitting community owes its prosperity to the popularity of the union suit and the modifications of this undergarment are very extensive. In the higher classes of expensive articles, they are made on flat frames like the Cotton's Patent and this type of frame has been greatly improved to give effect to the various styles which are in demand. The lace machine has been attached to this frame in order to produce those highly decorative lace effects which are such a prominent feature of fashionable evening dress. These patterns are ornamental in the highest degree and are outstanding in their charm and elegance. In recent seasons the tendency referred to in connection with the ladies' vest has been extended to the vogue for union garments and the cut has been made low at the back as well as the front, that is the shoulder supports of fabric have been practically done away with and the article has been supported by straps over the shoulder of the wearer.

This feature has also simplified the problem of manufacture, for the open nature of the top of the garment has given more room at the bust portion and has rendered fashionings less necessary. The natural lace stitch formed at the top by means of the lace machine has been replaced by ornamental edging attached to the neck portion of the garment and a touch of color has been added to the article by threading in fancy colored ribbon at the top. Articles of good style and form are also made on the principle of the cut-up trade and we are able to give herewith one of the simplest forms of design for ladies union garments also termed opera combinations, so-called no doubt on account of the low cut at the neck and the short leg which extends scarcely to the knees. The shape is given in proportion in length and width in Fig. 6 being the shape cut out of the double fabric which in this case lies 22 or 23 inches wide on the double. It will be noted that the shape on the left side is straight which indicates that this portion is cut out of the double fabric so as to give the opportunity of drawing the pieces out straight single ply and seaming one on top of the other according to the form of the garment. If this shape be drawn on the left the image of that on the right, the exact form of the finished article will show itself.

The various parts of the article may be traced by referring to the lettering on the right and left, from A to B on the right shows the form from the body into the waist, the article starting just about the bust at the top and shaping inwards to the waist as shown, this length being 8 inches. From B to C on the right the shape extenrs outwards again to the hips and at D the fullest width has been attained, naemly 10¾ inches on the double which when stretched out goes 21½ inches across. From B to D on the left is given as 13 inches in length. At D the shape takes the form required for the legs and the whole tendency is towards the right for a length of about 6½ inches, giving 10 inches wide at the bottom of the leg. There is thus a seam down the side of the leg on each side while a difference in cutting for the back and the front is shown on the left at the points marked B and towards C, the upper point marked "back" means that for the fabric which will form the back of the garment a cut is made from this point down to D for the back opening, on the piece which will form the front of the union garment the cut is made from the point marked "front" only. The whole article is thus seen to be more than 28 inches in length, there is a seam in the garment along each side of the body part, whilst in the legs there are two seams on each leg, one on the outside and another on the inside.

In finishing, the leg portions are turned up at the foot and seamed with a stitch which will not show on the outside, the other parts are joined with the flatlock seam, while the lace pieces at the top are attached by a machine designed for this work. This lace is often bought in long lengths and the required piece cut off, but this has the disadvantage of being in a material usually quite different in nature to that of the garment and often cold in handle; another machine is in large demand for making lace-like effects in the same yarn as the garment and attaching the pieces to the garment at the same time and is being supplied to manufacturers all over the world for making this edging on the garments, in fact the evolution of these machines has given a new impetus to this trade and has imparted to the commonest classes of designs a new status on the market, often lifting them from the category of cheap and common into the class of tasteful and ornamental.

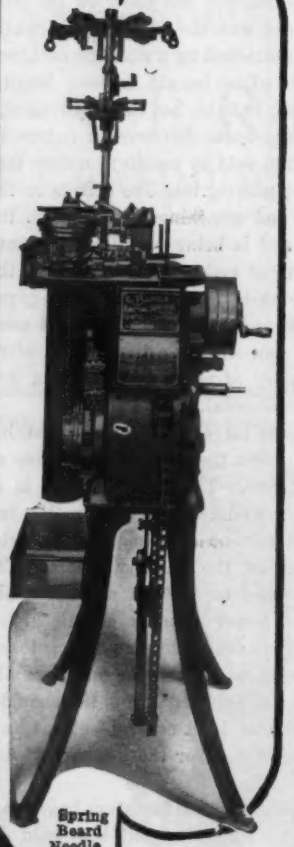
This style of article is also largely adopted for bathing dresses which have come to form the profitable side line of so many hosiery manufacturers. The general shape is as shown in Fig. 6 but certain modifications of a rather important kind have to be made in order to make the articles conform to the regulations of the bathing resort. The openings referred to as marked on the left are not made, whilst the neck portion had better be made a little higher than that shown in the diagram, the fabric requiring to extend upwards so as to come well over the busts of the wearer. Rather more fabric is required across the shoulder as a support and on one side at least several buttons have to be provided across the shoulder for the getting off and on of the article.

In recent seasons enterprising manufacturers have made a very lucrative business by branching out into bold designs and color schemes for these articles and during the past season the designs have surpassed all others in boldness. There has been established a kind of super-bathing dress with the use of increased material so that it becomes suitable for wear when sitting on the sands during the great heat of the day. These evolutions of color have lifted the bathing costume from being a dull and dowdy affair to that of an attractive scheme of color where, particularly at the neck and shoulder and the bottom of the legs, the fabric is attached in colors widely different to the ground.

Elaborate capes have also been devised which have given a further opportunity for the display of color and style. Many knitting concerns also cater for providing these articles in a certain definite design and color to conform to the rules of the swimming club which they are serving and which ensures a steady demand for these goods at a time of

The Banner

Full Automatic Hosiery Machines



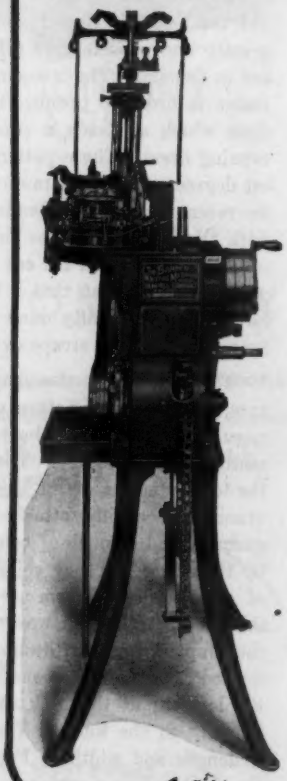
Spring Beard Needle Machine

Simplicity
Quality
Speed
Production

All Parts Accessible from the Front of Machine

We have just placed on the Market two new models– The Spring Beard Needle, built in sizes ot 3" to 3 3-4" diameter, and a new model —Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

Write for descriptive catalog



Split Foot Machine

HEMPHILL COMPANY

MAIN OFFICE AND FACTORY PAWTUCKET RHODE ISLAND

TRADE MARK

SOUTHERN OFFICE and SHOW ROOMS
912 James Bldg.
CHATTANOOGA, TENN.

PHILADELPHIA OFFICE and SHOW ROOMS
208-9-10 COLONIAL TRUST BLDG.
PHILADELPHIA, PA.

the year when the normal trade often lags. Very often when the manufacturer has lengths of knitted web left on his hands as not being quite suitable for the underwear trade, he can utilize it for making into bathing costumes and this gives a profitable outlet for this type of fabric.

In regard to the colors of these articles the dyer must make them conform to the test for fastness to salt water, while tests for fastness to light are also essential and important. The actinic rays of the sun are particularly powerful at the bathing season of the year, very few of the normal dyes being safe from fading under their penetrative action.

Among the Knitting Mills

The Earle Textile Company, Morganton, N. C., has been incorporated for the operation of a knitting mill. The capital is $500,000.

G. F. Ellis, Gaffney, S. C., is installing several knitting machines for manufacturing hosiery. Men's and women's finished hosiery will be manufactured exclusively.

The Burke Mills, Inc., capitalized at $50,000, has been chartered at Morganton, N. C., with R. O. Huffman, A. F. Garrou and J. M. Brinkley, of Valdese, among the incorporators.

Additional manufacturing space will be provided by the P. H. Hanes Knitting Co., Winston-Salem, N. C., for the production of ladies' silk hosiery. A modern office building, 50x50 feet, one story and basement, is being constructed and upon the completion of the new building the space in the factory now being used as an office will be equipped with machinery for manufacturing.

Nicholson Hosiery Mills, Chattanooga, Tenn., has been incorporated with a capitalization of $50,000. F. C. Nicholson, M. J. Nicholson, R. L. Westcott, A. C. and J. L. Foust are among the incorporators. Silk goods only will be manufactured. The erection of a building is not planned for the immediate future.

Paducah Hosiery Mills, Paducah, Ky., are planning for the addition of a plant for manufacturing paper boxes for hosiery packing.

Rome Hosiery Mills, Rome, Ga., will extend its facilities through the construction of a 60x100 foot two-story annex and the erection of a 40x40 foot brick office building.

The Welworth Hosiery Co., Creedmoor, N. C., has been granted a charter of incorporation with a capital of $50,000. N. J. Baddie, J. E. Harris and L. V. Peace are the principal incorporators.

A new stock company with a capital of $150,000 will erect a knitting mill at Reidsville, N. C., and W. L. Pannill, for the past several years connected with the P. H. Hanes Knitting Co., at Winston-Salem, will be the manager of the new company. It is planned to secure an existing building and have the plant in operation by May 1.

LaConte Knitting Mills, Knoxville, Tenn., have been incorporated by W. P. and Charles P. Biddle, L. S. Hall, C. H. Harvey and others. The capital is $50,000.

Browning Hosiery Mills, Nashville, Tenn., with D. P. Browning, of Louisville, Ky., as president, have increased their capital to $175,000 from $90,000, and additional machinery will be installed. They are manufacturers of silk, mercerized and heather hosiery.

Claussner Knitting Co., Paducah, Ky., has been incorporated with Robert Claussner, of Philadelphia, as president. The capital is $100,000, and ladies' full fashioned hosiery will be manufactured.

Simon Knitting Mills, 467 Woodward Avenue, Brooklyn, N. Y., will soon receive bids for the construction of its proposed new plant on Hart Street, estimated to cost about $60,000. The structure will be 65x100 feet. Henry J. Nurick, 34 Court Street, is architect.

Keap Knitting Mills, Brooklyn, N. Y., recently incorporated with a capital of $20,000, for the manufacture of knit goods, will operate a local works. The company is headed by J. Epstein, E. Moskowitz and S. Schlesinger. The company is represented by Dawson, Waugh & Dawson, 36 West Forty-fourth Street, New York.

L. Trepel, I. Berger and M. Seidenberg have organized the Trepel Knitting Mills, Brooklyn, N. Y., and plan for the early operation of a local works for the manufacture of knit goods products. G. Posner, 160 Broadway, New York, represents the company.

Fulton Knitting Mills Co., Wilmington, Del., has been incorporated under Deleware laws, with a capital of $250,000. Harry B. Wolfe, Harry C. Duncan and William Yeager, Lancaster, Pa., are the incorporators. The company is represented by the Corporation Registry Co., 900 Market Street, Wilmington.

Fayette Knitting Mills, Brooklyn, N. Y., recently incorporated, will operate a local plant for the manufacture of knit goods. The company is headed by C. Friedman and B. Neuwirth. E. I. Garver, 100 Graham Avenue, Brooklyn, represents the company.

Wallstedt Brothers, Inc., New York, N. Y., have been incorporated with a capital of $100,000, to manufacture knit goods. The company is planning for the early operation of a local mill. The company is headed by C. R., O. W., and M. A. Wallstedt; and is represented by G. R. Hendrickson, 31 Nassau Street, New York.

Harris Knitting Co., West Second Street, Harrisburg, Pa., is planning for the construction of a new three-story unit, 80x125 feet, at its plant. The structure with equipment is estimated to cost about $100,000. The company recently filed their plans for other additions to be constructed at its works to develop increased output.

The Amherst Knitting Mills, Inc., 540 East 180th Street, New York, N. Y., has arranged for an increase in capital from $35,000 to $75,000.

J. Berstein, Inc., New York, N. Y., has been incorporated with a nominal capital of $10,000, to manufacture knit goods. J. Berstein, M. and R. Wolf are the incorporators; and C. Goldstein, 1476 Broadway, New York, represents the company.

Atlantic Knitting Mills, Inc., 1270 Broadway, New York, N. Y., have filed notice of increase in capital from $100,000 to $200,000, for proposed expansions.

The Marvin Knitting Mills, New York, N. Y., headed by J. G. Margolin and S. and S. Abramowitz, have recently been organized with a capital of $10,000, for the manu-

facture of cotton and other knit goods products. F. J. Knott, Albany N. Y., represents the company.

The Henry Kahn Knitting Mills, New York, N. Y., have recently been incorporated under State laws, with a capital of $25,000, to operate a local knitting mill. Plans are now being perfected. H. Kahn and R. Hecht head the company. It is represented by A. Slater, 277 Broadway, New York.

The Bedford Underwear Co., New York, N. Y., recently organized by S. S. and L. Halpern and J. Samuels, is planning for the early operation of a local works for the manufacture of cotton knit underwear, etc. The company will operate with a capital of $30,000. J. A. Arnold, attorney, 22 William Street, New York, represents the company.

Trabulsi Knitting Mills, Inc., New York, N. Y., have filed notice of increase in capital from $15,000 to $50,000, for general expansions in operations.

Palace Knit Wear Co., Brooklyn, N. Y., recently incorporated with a capital of $20,000, will operate a local plant for the manufacture of knit goods products. The company is headed by M. Olesker and J. Schwartz.

Announcement of arrangements made by the United Hosiery Mills Corporation, of Chattanooga, Tenn., with Amory, Browne & Co., New York and Boston, whereby the latter will sell the entire production of the hosiery company, is viewed by some interests in the distributing trade as pointing toward centralizing of distribution through the larger and more powerful establishments. It will be recalled that last year the Durham Hosiery Hills, Durham, N. C., closed the New York office and entered into a selling agreement with the Hunter Manufacturing and Commission Co., of New York. Now that the United Hosiery Mills Corporation, the second of large southern manufacturing concerns, has decided to distribute through an established selling organization, similar moves by other mills are looked for, not especially for reducing the cost of distribution, but as in line with the trend toward merging for eliminating details involved in the handling of many accounts and for reaching distributors by the most direct route.

D. D. LITTLE, president of the Clinchfield Manufacturin Co., Marion, N. C., has resigned that position in order to give his entire time to the Appleton Company's proposed development of a 115,000-spindle mill and finishing plant in the South. At a meeting of the directors of the Clinchfield Co., Mr. Little was presented with a chest of silver containing 500 pieces.

MABRY HART succeeds Mr. Little as president, and H. F. Little is treasurer and general manager, with W. L. Morris as secretary and assistant treasurer.

J. A. BEECHER has become designer at the Riverside & Dan River Cotton Mills, Danville, Va. He was formerly at Clinton, Mass.

H. L. HOLDEN has resigned as superintendent of the Rocky Mount (N. C.) Mills to accept a similar position with the Rockfish Mills, Hope Mills, N. C., succeeding D. M. Myers.

J. F. ARMSTRONG has been promoted to assistant superintendent of the Efird Mills No. 4 and 5, Albemarle, N. C. N. F. Thompson has been made assistant superintendent at Mills No. 1 and 2. C. G. Voss is superintendent of these mills.

Economical Heating and Ventilating.

A new system of ventilating and heating, designed especially to effect the economical ventilation of buildings in which some of the rooms are not occupied continuously, has been developed by the Buckeye Blower Company, Columbus, Ohio, and is described in an attractive booklet recently issued by that company.

This new system is known as the Buckeye "Heatovent," and should be of interest to textile men as having an application in mill community houses, school buildings, Y. M. C. A. and Y. W. C. A. buildings and other places where continuous heat is not required throughout the entire building. When a building is equipped with this system, the description points out, a room is heated and ventilated only when occupied, to the end of effecting economy in this direction, based on the same principle of a separate switch in each room for electric lights.

The "Heatovent" is a complete, self-contained fan blast ventilating system enclosed in a compact steel cabinet. Two low speed multiblade fan wheels are mounted directly on opposite ends of a motor shaft. These fans draw a supply of fresh air from out-of-doors, through a compact pipe coil heater which heats the air to the desired temperature, and this warmed air is then discharged from the cabinet into the room through small louvre openings at the top of the cabinet across the front and ends. The final temperature of the air is regulated by a balanced mixing damper in the air intake which directs all or part of the air through the heater, allowing the balance to by-pass directly to the fans. Passing through the fans the cold and warm air is intimately mixed so the final temperature of the air leaving the cabinet is uniform.

As pointed out, the system gives each room an individual ventilating system. When a room is occupied and ventilation is desired, it is only necessary to push a button, which starts the motor and the fans deliver the desired temperature uniformly. A push of a button is necessary to stop the operation when the room is vacated.

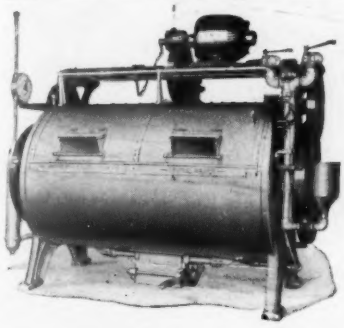
Illustrations showing installations of the equipment in various types of rooms illumine the bulletin under consideration, and show the cabinets containing the units to be attractively designed and constructed. It is further pointed out that a special construction prevents any noise or vibration of the operating parts. A variety of illustrations are shown, as well as design diagrams showing details of construction and methods of installation of the various types of this unit which are furnished.

Cotton manufacturers interested may secure copies of this booklet upon application for Bulletin No. 122.

W. L. BEYER, well known in the textile field as a former superintendent, has become associated with L. Sonneborn Sons, Inc., of New York City, representing them in the Georgia-Alabama territory. Mr. Beyer has been in the mill business practically all of his life, up until two years ago when he resigned as superintendent and treasurer of the Cochran (Ga.) Cotton Mill Company, and his many friends will be pleased to hear of his re-association with the industry of this section.

W. P. HORNBUCKLE, formerly superintendent of the Minneola Mfg. Co., Gibsonville, N. C., has accepted the superintendency of the new gingham plant of the Lola Mfg. Co., Stanley, N. C.

AMERICAN FINISHING MACHINES *for* KNIT GOODS TRADE

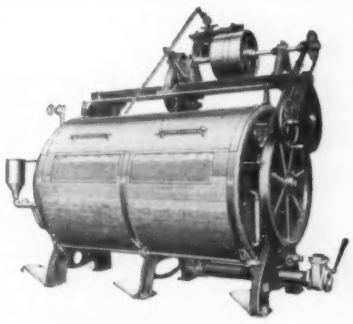


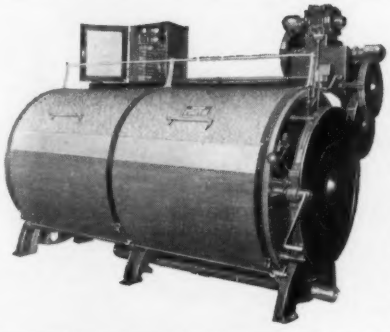
Dies Silk without roughening

The Cascade Dyeing Machine will handle the sheerest silk hosiery without the least roughening. It is also ideal for the boiling off and finishing operation.

It has features you'll like

Selected materials, low cost of upkeep, huge production, perfect results, and economy of supplies — these are some of the points you'll appreciate in this belt driven Acme Dyeing Machine.



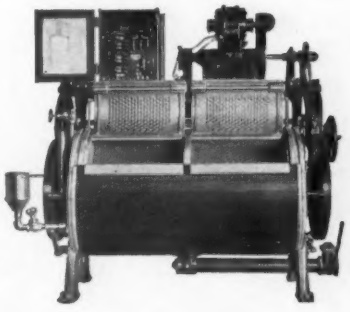


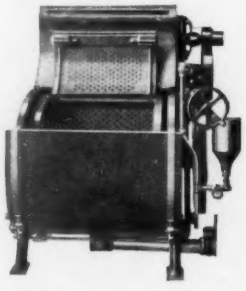
Uniform Dyeing

The Acme Motor Driven Dyeing Machine is electrically controlled and its forward and reversing action accurately timed. This aids greatly in producing uniform dyeing of the most delicate shades, and prevents tangling.

Dyeing without nets

There are six compartments in this Monel Metal Dyeing Machine. Hosiery can be dyed without the use of nets. This is extremely practical for small lots of light shades, and it produces 100 per cent results.



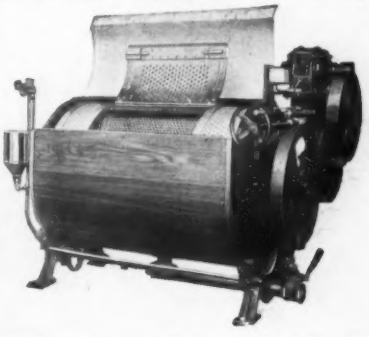


Light shades as well as dark

This small sized Monel Metal Dyeing Machine does away with the light shade tank and puts the dyeing of these colors on the same production basis as the darker ones. This saves time, labor and supplies.

An all-round good machine

Equipped with all safety features, economical in operation, and uniform in results produced — the American Monel Metal Dyeing Machine is one that fits efficiently into any mill, large or small.



THE AMERICAN LAUNDRY MACHINERY CO.

Specialty Dept. C, Norwood Sta., Cincinnati, O.

Canadian Factory:
The Canadian Laundry Mchry. Co., Ltd.,
47-79 Sterling Road,
Toronto, Ontario, Canada

British Sales Agency:
American Laundry Machinery Co., Ltd.,
36-38 Victoria Street,
London, S. W.-1 England

Send the attached coupon for full information

Fill out and mail the attached coupon today and full information will be sent you by return mail.

The American Laundry Machinery Co.,
Specialty Department C,
Norwood Station, Cincinnati, Ohio.

Please mail me full information covering the "American" Line for Textile Manufacturers.

Signed .....

Business Address.....

City..... State.....

TIME was when we measured exactness in fractions of inches. Today we measure it in thousandths.

What fifty years ago was almost incredible exactness is now common standard for Torrington Needles. All of the important dimensions on a knitting needle are held to closer limits than a hair's breadth.

We "split hairs" every day to get the exactness we require.

The TORRINGTON COMPANY
TORRINGTON CONN. U.S.A.

C. B. BARKER & CO., LTD.,
140-144 W. 22nd STREET,
NEW YORK.

MANUFACTURERS SUPPLIES CO.,
CHERRY AND JUNIPER STS.,
PHILADELPHIA.

The Knit Goods Market

Trading in the knit goods primary market was comparatively quiet throughout February, after a somewhat disappointing business in January. There were occasional spurts of fairly active buying of hosiery, and several establishments report they had the biggest weeks business in a long time. But these were representative of a few bright spots. Considerable underwear, of both summer and winter weights was contracted for, much of this business representing deferred orders.

Last month brought no evidence of an intention on the part of jobbers to depart from their policy of buying for very short periods, and it may be stated that of 65 hosiery orders booked by one commission house in six consecutive days, more than 75 per cent called for deliveries not later than April. This reflects a healthy condition, for stocks among distributors and retailers are known to be low, with no material accumulations at mills; and with the practical assurance that the country's increased purchasing power will absorb more merchandise than dealers have thought of providing for.

Jobbers are afraid—afraid first, of a seriously disturbing outcome of affairs in Europe; not altogether satisfied with economic conditions at home; in dread of radical legislation, and professedly fearful that existing prices in the primary market will necessitate mark-ups in retail stores that will be made a pretext for curtailed consumer buying.

A few startling headlines on the financial and commercial pages of the newspaper are sufficient to upset the average jobber. One day we read, "Strife in Europe Hits Boston Wool." On the next the cables tell us of an advance of 5 per cent in the price of wool at the London auction sale. Wool is about as high, relatively, as cotton, and while apparently trustworthy reports indicate that supplies of both fibers are below consumption, it cannot be denied that, in the present world situation, with confidence in about everything and about every nation shaken, prices are at an uncomfortable level from the viewpoint of those who must make their commitments for raw material and finished goods well in advance of their turnover. The buck has been passed to the manufacturer, who now is practically forced to buy his supplies on about the same basis as those to whom he sells are operating.

Prices of wool and cotton showed sufficient firmness while manufacturers were declining to operate to establish the belief in many minds that material recessions will not be witnessed, and that so soon as jobbers are compelled to replenish, prices will stiffen. Of course, no distributor has bought goods on replacement value. Hosiery in stock or on order is good, safe property, except there be a commercial upheaval. It was bought at prices that cannot be expected to go lower. On the contrary, subsequent purchases probably will cost more.

Manufacturers have borne the brunt of the price battle. They were buying supplies ahead for three to six months on low cotton when their customers were predicting declines. Thus they have been able to maintain price schedules so far under replacement that it would seem surprising they are not receiving better support from the distributing trade at this time.

Buyers themselves admit the price trend is upward, but they are not covering for their seasons needs; they are not taking the chance that the manufacturers did and will take. The attitude of many is expressed by one in New York, who takes the precaution to state he is not a pessimist, yet predicts that the price of cotton cannot be maintained; that from August or September on a break will be recorded; that the market is not in a healthy condition, and that this is a time when all should operate with caution. He suggests that manufacturers and jobbers might do well to be satisfied with a little less profit.

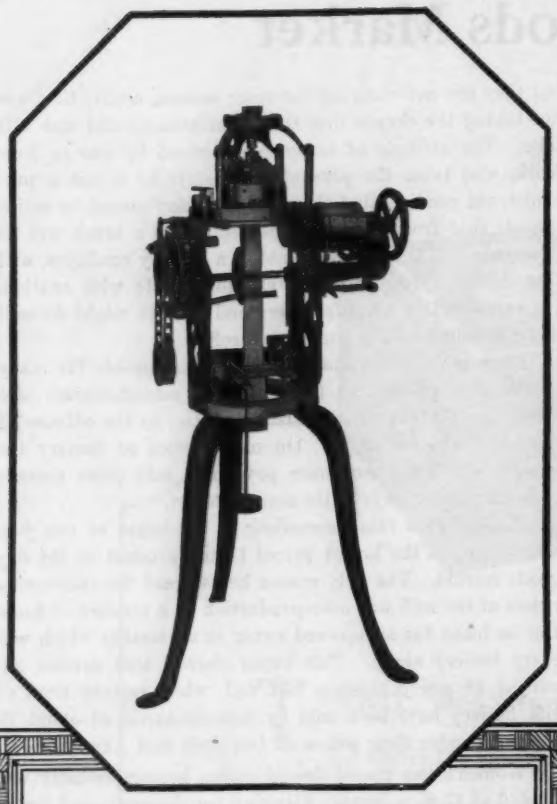
There is no doubt that profits are responsible for many of the high prices, but there are few manufacturers who can be properly accused of being parties to the offense of "soaking" the consumer. On many types of hosiery the margin which the consumer pays over mill price exceeds what the jobber pays to the manufacturer.

Hosiery as a class, according to the buyer of one jobbing house, is the lowest priced textile product in the dry goods market. The only reason he assigned for inadequate prices at the mill was over-production in a number of lines. But he looks for an upward swing in all textiles which will carry hosiery along. This buyer showed that denims advanced 18 per cent since last fall, while certain lines of silk hosiery have been sold by manufacturers at about 10 per cent under their prices of last July and August.

Women's two pound fleeced cotton hosiery recently was quoted at $1.85 a dozen. Allowing for discounts and terms, the manufacturer selling at $1.85 really gets but $1.81. It is shown by a mill executive that the approximate cost of this stocking in a southern factory is $1.80 a dozen. This, then, is one line to which the New York jobber's suggestion of lower profits for manufacturers cannot apply.

Low end cotton hosiery has been bought in fairly large quantity since the first of the year, but usually at distressingly low prices. A southern mill reports being sold up at $1.10 for 176 needle loop toe half hose, subject to 2 per cent discount and freight allowance. The mill is quoting $1.15, although another still is asking only $1.10 for socks weighing 20 ounces and $1.30 for 24 ounce. Women's 176 needle cut toe carded hose is quoted at $1 a dozen by several mills which recently advanced the price 2½ cents, thereby incurring the displeasure of buyers. The latter say they cannot understand why advances on low end cotton hosiery since last summer should aggregate as much as 30 to 33 per cent, while on ladies mercerized the advance has been only about 10 per cent. These critics overlook the fact that at no time since the 1920 slump, when there were stock accumulations that brought a number of mills to the verge of bankruptcy, have manufacturers put an adequate price on the cheaper grades of cotton hosiery. They overlook the fact also that demand is a factor in regulating price and that sometime ago there was very keen demand for this class of stocking, buyers in many instances combing the market for desired deliveries. When prices shall have been moved up, as they shortly must be, to a basis of cotton at 28 to 30 cents, these buyers will be industriously engaged looking for goods at about present quotations.

Ladies mercerized 220 needle hosiery, advanced by one important manufacturer from $2.50 to $2.75 a dozen, is being taken at the latter figure as freely as it was bought



BRINTON RIBBERS

possess all modern improvements, including selvage welt, French welt, double knee dogless and striping attachments, with automatic stop motions.

Built in all sizes, for all classes of rib work.

We also build hosiery knitters and Body machines for underwear and various other circular machines for all kinds of knitted articles.

Samples and prices on request.

H. BRINTON COMPANY

Kensington Ave. & "M" Street

Philadelphia Pennsylvania

HOSIERY PACKING

TOE STICKERS
RIDER TICKETS
BOX END LABELS
BANDS

DEPENDABLE SERVICE
HIGHEST QUALITY
LOWEST PRICES

You know the many sales advantages arising from a uniformly packed TRADE MARKED line and if you have not already adopted this worthwhile packing feature let us assist you by submitting sketches of appropriate designs.

If you are already using seals, riders, etc., send samples and quantities for quotations. Prompt attention to inquiries.

KIRBY-COGESHALL CO.

MILWAUKEE WISCONSIN

"Royal-Chicago"
PRODUCTS

STANDARDIZED INDUSTRIAL SEATING

Seating the worker so that each can produce more efficiently need not mean a variety of special chairs or stools. . . . . The posture requirements of the individual worker may be met by *standardizing* on one type of seating.

This type, if adjustable to height and with an adjustable back-rest, enables the seating to be shifted to different operations and be equally adapted to workers at each.

It reduces both expense and purchasing effort.

FS-14 Patented Adjustable

ROYAL METAL MFG. COMPANY

Builders of Correct Industrial Seating

2325-29 S. Western Ave.

CHICAGO, ILLINOIS.

FS-15 Patented Adjustable

at the former. Some of the competitors of this mill were tardy about advancing, but now a few are quoting $2.85. All-mercerized half hose of 200 needles are held at $2 a dozen, an advance of 25 cents, and 220 needle have been moved up to $2.35 from $2.15. There is a comparatively good market for this class of socks, and of some numbers of ladies and misses combed goods several mills are back in deliveries, which must be made at lower than existing prices.

The tendency to slow down on production as supplies of yarn approach exhaustion is indicated in the policy of an Eastern mill which, while operating at capacity on some numbers, has curtailed its output of silk hose. The company refuses to buy silks on the present market until it has assurance jobbers will buy at the higher prices, and, until they do so, machinery which now is idle will not be put in operation. It is unfortunate that other manufacturers are not pursuing this policy in relation to staples of silk and cotton. Satisfactory prices will not be obtainable so long as distributors believe there are stocks in the mill. This is well illustrated in the silk hosiery situation.

An Ohio mill recently bought 25,000 pounds of hosiery tram, thrown, at $9. This is about $1.50 a pound more than manufacturers were paying sometime ago, when they were getting from $1 to $1.50 a dozen more for their hosiery. As expressed by a Philadelphia jobber, it looks as though the higher the price of silk, the lower is the price of silk hosiery.

The congestion in silk hosiery is indicated in the prices fixed by some of the department stores for their special sales. Full fashioned standard silk boot stockings were sold in Philadelphia on several occasions during January and February at $1.00 to $1.15 a pair. The lowest mill price yet heard for this character of stocking is $12.50, for a ten thread, very few mills, however, selling at less than $13.50.

Hosiery of all-silk probably suffered from the very free offerings of Japan and artificial silk in combination, one mill quoting $6.50 a dozen for a ladies stocking of this fabric, and $3.75 for two tone half hose, $1 more for embroidered clocks.

It is suspected, in view of some of the very low prices heard for even distress lots of full fashioned silk hosiery, that some unsuspecting buyers have acquired seconds when they thought they were getting firsts. A jobber several days ago submitted to a mill manager a sample stocking which he said was offered to him at 75 cents a dozen under the mill's established price. "Would you advise me to buy them?" he asked. The stocking was in the mill packing, the carton bearing the manufacturer's number, and there appeared to be nothing irregular about the transaction, except the price. But after the manufacturer had taken one look at the paper box containing the sample, he said, "I would advise you not to buy them at the price you mention. As they are seconds, the figure you give me would be entirely too high."

It is stated by several manufacturers that seconds of women's full fashioned standard silk boot are offered by one large establishment at $8.25 a dozen, and not moving freely. A jobber states he can beat this by 50 cents, and that he acquired a lot to go over the retail counter at $1 a pair. Some dealers say they have a better market for high grade seamless firsts than for seconds of high grade full fashioned plain boot.

Owing to the popularity of silk hosiery of the very gauzy variety, for which the trade description is chiffon, it is possible to obtain approximately fair prices for it, and it is understood that such a stocking made of four thread silk sells for more, in many retail stores, than a staple of 10 thread. There would appear to be about as much excuse for chiffon hosiery in winter as furs in summer, but the ladies will have them and they pay the price.

Heretofore chiffons have been made on full fashioned machines only. Now they are being offered quite freely by mills which seem to have solved the problem of how to knit a good "hair-net" stocking on circular machines. It is stated by several dealers that seamless made chiffons, at very much lower prices than the full fashioned, are being bought so freely that the latter would appear to be facing price competition. Silk hosiery should be in better demand very shortly, with the laying aside of wool and silk-and-wool in combination.

While fall lines of hosiery have been on the market for some time and some little business placed, manufacturers have received little encouragement. Purchases by jobbers are confined almost exclusively to heathers of wool and cotton in combination, and these promise to be very popular for men, women and misses. But the all-wool and silk-and-wool in combination are not moving. It is stated that in order to meet jobber notions of prices, heathers of wool and cotton are being somewhat cheapened by the use of more cotton and less wool. In fact, the line of one mill striving to meet the demand for price rather than quality is referred to as of "cotton and wool." Heathers of all cotton are a good number with some mills as a 25 cent retail proposition, this contemplating a well made stocking.

Novelties in hosiery are still being brought out, contrary to the views held in some quarters that this is to be a year of staples with novelties disappearing. Were this view to obtain generally there would be such a crowding of the field of staples that manufacturers' profits would vanish entirely. It is the innovations that are making a little money for mills, and the manufacturer who manages to keep a pace or two ahead of the other fellows in the matter of new patterns and styles is the one who is getting a modicum of cream with his milk.

There has appeared on the market a ladies' two tone vertical striped stocking of silk and mercerized, in rib effect, which promises to be a winner. Then there is a line of mercerized golf hose with tops of the jacquard order, in combinations of vivid colors, the effect being unusually striking, yet appealing, as is disclosed by the business being placed by sporting goods houses and some of the more progressive jobbers as well. Such a stocking would yield a retailer a normal profit if sold at $1 a pair. A New York dealer says he would not think of discrediting the stocking by offering it at less than $1.50.

J. P. Quinlan recently put on sale a line of ingrain artificial silk hose for children and infants socks, the former to sell at $1 a pair retail, the latter at 50 cents. The socks are shown in eight distinctive patterns, and the number may be increased by adapting combinations in top and leg to conform to the most fastidious taste. As staple lines of infants socks have been dull for some time, a drive on the ingrain artificial is being made.

Business in regular lines of infants socks, which has been lagging for more than six months, recently showed some little improvement, and a few jobbers have been in the market with repeat orders. Many jobbers carried considerable stocks of this class of goods over from the previous season, but it is estimated that, allowing for the carryover,

ABERFOYLE MANUFACTURING COMPANY

MERCERIZED YARNS

MAIN OFFICE
EMPIRE BUILDING
PHILADELPHIA

ADAMS-FRANKLIN BUILDING
CHICAGO

MILLS
CHESTER, PA.

WESTAWAY BUILDING
HAMILTON, CANADA

they have not bought more than 50 per cent of what will be required to cover their season's needs.

In some few of the Pennsylvania hosiery mills there has been some difficulty in keeping abreast of orders even in a supposedly slow hosiery market. This is ascribed to indifference on the part of much of the mill help. A manufacturer who was approached on this phase of the situation produced his records for the previous week and showed that whereas he should have turned off 1,000 dozens with the help employed, the output was only 790 dozens. A great part of the help, it was stated, draws about $20 a week in wages, yet is indifferent as to whether earnings go on or not, and operatives recently were rather pleased with a two-day shutdown due to a temporary collapse at the power source.

A recent compilation, accepted as trustworthy, that hosiery mills in nine southern states last year installed approximately 2,500 additional knitting machines, was regarded by some interests as pointing to further congestion of an already over-supplied market. There probably is little cause for alarm over any material increase in production by reason of these installations, for it is known that some machinery was removed to the South from mills in Philadelphia, which had discontinued operating on the ground of a scarcity of help at wages which northern manufacturers are able to pay, and it seems likely there was shifting of equipment from other mills, to say nothing of machinery which had to be displaced in the process of modernizing mills for keeping overhead cost down to an irreducible minimum.

There is no denying that of most types of hosiery there is too much for healthy mill operation, while there are but few of which there can be said to be an underproduction—and it will be no fault of progressive manufacturers if the supply of these does not catch up with demand.

Underwear, apparently, is in a better position than hosiery, from the viewpoint of both manufacturer and jobber, this being true particularly of summer weights. Light weights were bought early, at prices but slightly advanced from those of a year before, and are a good asset. Retailers realize the truth of this, for they are reported by jobbers as having bought so liberally as to revive recollections of merchandising when it was done in the regular way. In fact, some jobbers have said they believed not a few retailers had bought too heavily. These dealers probably have a keener appreciation of conditions. As there have been radical price advances since initial orders were placed it will be admitted that the retailers who contracted early for a goodly part of their spring and summer requirements can be accused of no error of judgment.

Price revisions on some lines of summer underwear have been so sharp as to be startling. The Otis Company, Ware, Mass., advanced one of its leading numbers of shirts and drawers a dollar a dozen—from $5.50 to $6.50—and union suits by just twice that much, to $12. The company had sold only 25 per cent of its output at the lower figures, rejecting many of the early orders, and allotting to few jobbers more than one-fourth of their specifications. Buyers have been taking the garments at the new prices—they are paying the advances, as they will to hosiery manufacturers when more of them pursue the policy of those who make distinctive lines of merit and put out prices that will

stick, taking their place in the procession where there is the least crowding.

Activity in men's summer underwear is especially pronounced in the better grades of bal briggans, of which, it is predicted by manufacturers and jobbers, there will be a scarcity. All mills making the bals are sold well up, and a few have nothing for delivery until late in the distribution season. In this class the trade places A. V. Morris & Sons, Amsterdam, N. Y., and it is understood the Atlas Underwear Company, Piqua, O., has sold exceptionally large bookings of light weights and is near the end of its production for the coming season.

Repeat orders for men's summer underwear have been coming in freely, for quantities, considering recent price advances, that are considered satisfactory. Salesmen on the road have had a good response from retailers, and as to most lines, manufacturers no longer are accepting orders for early deliveries. With some, help is scarce, and yarn supplies are near the point of depletion.

Orders for underwear next fall are greatly in excess of the bookings for the corresponding period during any year since 1919, according to manufacturers, and there seems no doubt that jobbers as a whole have already contracted for 70 per cent of last fall's total. Many of the mills have booked production to cover their present supplies of yarns, running their machines through September. The Appalachian Mills Co. and the Standard Knitting Mills, Knoxville, Tenn., are reported having sold the big end of nine months production, and it is stated that neither is pushing for orders calling for deliveries this side of October. The southern mills are delivering against orders placed for the first quarter of the year, and such goods are being bought, at advantageous prices, by retailer mills, to take them in not later than April.

It is believed that one explanation for jobbers operating in winter underwear on a more nearly normal basis is the fact that mill prices have been lower in proportion to the pre-war value than the price of either raw material or labor, so that it is fair to assume there has either been a very great increase in manufacturing efficiency on the part of the producers or that they have been unable as yet to put their products on a profitable basis. But higher prices at mills are looked for, as to future requirements. Either the raw material market must go lower without a change in prices of the underwear or large advances will have to be put in force.

One of the leading mills in the Central West has sold considerably more underwear for next winter than was contracted for last year to the corresponding dates, but its prices were so low comparatively that, considering the status of its various numbers in the trade, they could not be resisted by buyers, and some are understood to have placed initial orders amounting to 80 per cent more than their first purchases for the winter of 1922-23. The mill was fortunately situated as to worsted and cotton yarn, but it is intimated supplies will have been exhausted well before jobbers come in with their repeat orders, so that it seems certain later contracts will be on a basis of considerably higher figures.

Some few jobbers, foreseeing a rise, have called for samples, intending to canvass retailers very early. In the opinion of a Baltimore jobber, this year's business in underwear promises to exceed that of any year since 1919.

Women's knitted underwear for summer is reported slightly more active, on advanced prices. Many jobbers missed an opportunity. Low end vests, which were offered at 82½ to 85 cents a dozen when the season opened and were bought very sparingly, have moved to 92½ to 95 cents, with standard grades of light weight vests being quoted around $1.25 to $1.35 a dozen.

Knitted underwear for ladies seems to have declined in volume of sales, with the inclination of woman to wear less, and the union suit in particular appears to be the least popular of the undergarments. The chemise and, to some extent, the brassiere have taken the place of the knitted undershirt, and the union suit is passing with the more general use of knickers and bloomers.

Distributors have been buying sweaters less conservatively than at the start. Novelties which to some extent are regarded as staple for a time have sold in fair volume, but conditions among manufacturers are not such as to cause any enthusiasm, and are reflected in the spotty buying of worsted yarns, which seem destined to go higher. While trading in sweaters for fall has improved, there is only a fair degree of activity in the gay and fetching garments for summer. It is a foregone conclusion that the bulk of the heavyweight sweaters will have been contracted for in good season.

New Equipment for Textile School.

Two new humidifying systems have recently been added to the Textile Department of the North Carolina State College, Raleigh, North Carolina. This equipment has been donated by the Parks-Cramer Company, Charlotte, North Carolina, and the Bahnson Company, Winston-Salem, North Carolina.

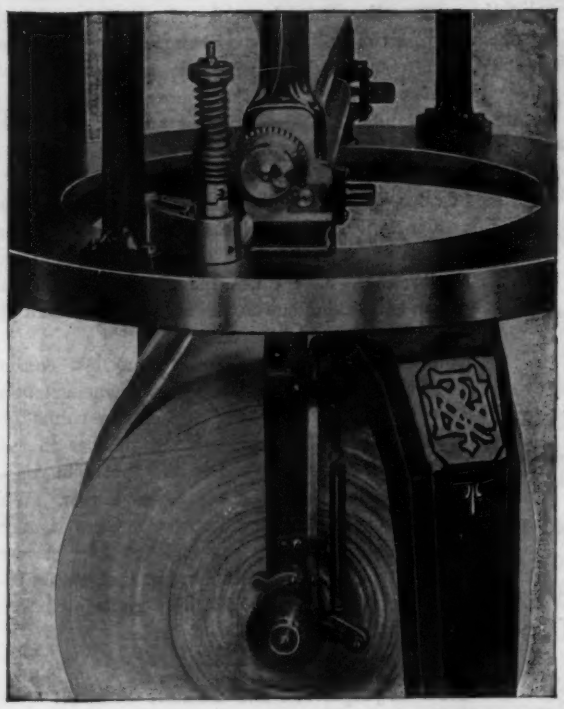
The Parks-Cramer system has been installed in the carding and spinning room and is complete in every detail, having automatic control, and is the latest production of this company. The Ingersoll-Rand Company, of Philadelphia, contributed the air compressor, and the Goulds Manufacturing Company, Seneca, New York, the water pump, which are used in connection with this system.

In the weave room the Bahnson humidifiers have been installed. This system does not require the use of a pump but is connected directly to the water system in the building. All the humidifiers have automatic control and are of the very latest type.

Another recent addition to the equipment has been a new eight head comber made by the Whitin Machine Works, Whitinsville, Massachusetts, which was presented by that company to the textile department.

This textile department is the textile school of North Carolina, and has a registration of one hundred and sixty-six students. There will be a graduating class this year of thirty-one, which is the largest class ever graduated from the textile school.

Reiff & Company, Drexel Bldg., Philadelphia, have announced their appointment as sole American territorial agents for Philipp Bauer & Company, Germany, and their allied company, the N. C. Transatlantische Handel-Maatschappij, Germany and Holland. Philipp Bauer & Company's products, they state, have been distributed in the American markets for 40 years.



Screw Take-up and Improved Winder

Attention

to each minute detail has been responsible for the progress of Nye & Tredick Ribbers. Motivated by a desire to achieve convenience of operation and a production of quality fabric, our Engineers have developed the present design. The illustration shows two of the details of construction which carry out these aims.

The screw Take-up is sturdily constructed and of a sensitive yet positive action which produces an even tension resulting in high grade cloth. Our No. 2 improved Winder having satisfactory capacity and a design which is mechanically perfect is supplied for the convenience of those users who prefer this attachment to our work cans.

Our new illustrated catalog will be of significant interest.

Trump Bros. Machine Co.

Successors to

NYE & TREDICK COMPANY

WILMINGTON, DELAWARE

DIXIE MERCERIZING CO. STRENGTH QUALITY LUSTRE CHATTANOOGA, TENN.

Mercerized Yarns

C. P. Mercerized Cones & Skeins

20/2-80/2 Natural and Gassed

DIXIE MERCERIZING CO.

CHATTANOOGA, TENN.

REPRESENTATIVES: Philadelphia, Pa., Cameron & Pfingst—Reading, Pa., Cameron & Pfingst—Chicago, Ill., 817 Old Colony Life Insurance Bldg.—Toronto, Canada, Slater & Co.

Steel Shelving

Lupton INVESTMENT VALUE PHILADELPHIA

Factory quipment

From Warehouse Stocks

David Lupton's Sons Company

Amber St. and Allegheny Ave.

Philadelphia

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks.

Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.

99 Beekman Street NEW YORK

The Yarn Market.

As January drew to a close, cotton yarn quotations on the Philadelphia market continued the advance started some time back, and were going to a substantially higher level generally, but after reaching a high point just as the month passed away, quoted rates began receding and the list broke back down to lower levels.

Two-ply skeins 26s were quoted here last month, as of January 17, at 57 cents. On February 16, these yarns were listed at 58 cents, but had in the meantime gone up to 61 cents asked. This latter price was quoted on January 28, just about the time the revision in prices came about. Similarly, 30s two-ply warps, for which 62 cents was asked on January 17, went up to 65 cents quoted on the 28th, and then back to 61 cents asked and 60 bid on the 16th day of February.

Thus it will be seen from these representative illustrations in the list, that the market practically lost the gain made in January or the latter part thereof, although with this condition the fact remains that a comparison of rates now and two or three months back shows the list on a considerably higher plane as regards prices. The market seems to be working ahead to higher ground, undismayed, perhaps, by temporary set-backs, it was pointed out, and the present reduction is classed as one of these set-backs.

A search for the cause of the reduction, the sudden clogging of carbon when the market seemed to be taking the hill of prices in high, reveals to the light no specific instances. It seemed to be the sentiment from the other side of the argument that the market had already achieved the crest of the hill and was going the other side downward. It was a fact, however, that throughout the month the fluctuations of the raw staple market had no apparent effect upon yarns, although basically, it was pointed out, the continued strengthened condition of cotton, bringing from the spinners a higher price for their staple, and in some cases a premium for the more particular in their demands, was one of the contributing factors to the more determined firmness with which spinners held out during the first weeks of the year. But of slight changes on the cotton market and normally effective reports from various sections of the country, yarns seemed to be serenely oblivious, it being stated that now the market in itself has its own fundamental factors upon which its changes and variations are based and by which they are determined.

As to demand, it continued sluggishly through the period being reported, though, as always, sporadic instances of good business placed were announced. One feature pointed out as a possible contributor to this situation was the fact that buyers, in special lines, had pretty well covered requirements during January, and these yarns were coming in during the succeeding month. It was further stated that yarn consumers as a class were more concerned over the possible disposition of their own manufactured products than in supplying themselves with further material for stock; they had rather leave that to the spinners, apparently.

Of those buyers coming into the market, some of them found it necessary to pay considerable premium on the privilege which they exercised in waiting.

One feature of the market to be mentioned was the irregularity of the prices. While the list published below may be considered as representative, there are instances where the rates there given are considered too high, and, on the other hand, factors will be found who say they are not strong enough to represent the trend. It was a fact, however, that individual rates were so irregular, in themselves and in comparison with other quotations, that no perfectly accurate summary of prices could be made.

Following are quotations on the Philadelphia market on February 16:

Single Skeins.

4s to 8s	41	10s	42
12s	42½	14s	43
16s	44	20s	47½
24s	51 @52½	26s	54 @54½
30s	56 @57		

Single Warps.

8s	42½ @43	10s	44 @44½
12s	45½	14s	47
16s	47½ @48	20s	50½
26s	55 @56	30s	58 @59
40s	65 @66		

Carpet and Upholstery Yarn in Skeins.

8s and 8s 3-4 slack	43
8 3-4 tinged tubes	41½
8 3-4 hard white twist	42
8 3-4 hard twist waste	40½

Two-Ply Skeins.

8s	42½ @43	10s	44
12s	45	14s	46
16s	47	20s	50 @50½
24s	55 @56	26s	58
30s	59 @60	40s	67 @68

Two-Ply Warps.

8s	42½ @43	10s	44 @44½
12s	45½	14s	47
16s	47½ @48	20s	50½ @51
24s	57 @57½	26s	59
30s	60 @61	40s	70

Frame Spun Carded Yarn on Cones

8s	42	10s	42½
12s	43	14s	43½
16s	44	18s	45½
20s	46	22s	47
24s	48	26s	50 @50½
26s	50 @50½	30s	53½ @54
40s	65		

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	60	20s	62
24s	65	30s	68
40s	75 @78	50s	85 @88
60s	95 @98	70s	$1.05
80s	$1.25		

Mule Spun Carded Yarn.

10s	44	12s	45
14s	46	16s	47
18s	48	20s	49
24s	51	26s	63
30s	67	40s	71

Mule Spun Combed Peeler Yarn on Cones.

10s	53	12s	54
14s	55	16s	57
18s	58	20s	60
22s	63	26s	68
30s	75	36s	85
38s	87	40s	90 @95

Ivanhoe-Regent Works of General Electric Co. has produced an industrial lighting unit to meet the most exacting requirements of this type of illumination. "Glassteel," the trade name of this unit is regarded as the most notable development since the introduction of the RLM reflector. As the name suggests, the best features of glass and steel are combined. The unit consists of a white porcelain enameled steel reflector and a glass enclosing diffusing bowl. When assembled the unit has a pleasing appearance and is of rugged enough construction to minimize danger of breakage. Provision has been made for lighting surfaces above the unit by permitting light to be reflected upward through apertures pierced in the shoulder of the steel reflector. The dust proof construction of the unit is a point in favor of low maintenance. By supplying the Ivanhoe Glassteel unit in 18 to 20 inch reflector sizes, sufficient range is afforded for all types of industrial installations. Special recommendation is made for this lighting equipment in cotton mills.

It's usually the man who isn't to blame who says "Beg pardon."

Right to Restrain Misleading Advertising

BY LESLIE CHILDS.

It goes without saying, that a reputation for manufacturing a product of quality and class is of great value to any manufacturer. It may take years to establish such a reputation, in relation to a given line of goods, and even when so established may only be maintained by the continued marketing of a product of merit.

If then another person proceeds to sell such a manufacturer's goods, by misrepresenting the quality to the injury of the reputation of the manufacturer, the question of the right of the manufacturer to enjoin or restrain such action may become one of great importance. The point is one of several angles, and cannot be covered by the statement of a hard and fast rule that would apply in all cases; this for the reason that the outcome of each case of this kind must necessarily depend, in a great measure, upon the particular facts involved.

However, generally speaking, and without regard for particular cases, a person has no right to advertise the product of a manufacturer in a misleading manner, and if he does so to the damage of the manufacturer the latter may have such action restrained. The application of this rule of law, to one phase of the subject under discussion, is illustrated in an interesting manner in the recent case of Cheney Bros. vs. Gimbel Bros., 208 Fed. 746. The facts and circumstances which culminated in the action were, as taken from the report, substantially as follows.

The complainant, Cheney Bros. it appears, was a manufacturer of foulard silks and disposed of a quantity of their 1921 seconds to jobbers at a low price. It was complainant's custom, it seems, to close out each season's goods before launching the new styles, and these seconds were sold as such with complainant's private mark, though they did not bear any of the Cheney trade-marks.

The defendant, a retail firm, purchased a large amount of the foulard silks from the jobbers mentioned above in April, 1922. Shortly thereafter the defendant proceeded to place the goods on sale, and to advertise the event very extensively. In its advertisements the defendant, among other things, announced:

"A sale of the famous foulard silks made by Cheney Bros., * * * * * fine quality foulards, the world's best * * * * * which lends itself so gracefully to the fashions of the season." The advertisement in addition stated that the identical fabrics were being sold in several of the principal shops in Greater New York for from $2.38 to $3.50, while the defendant was selling Cheney's foulard silks for $1.59.

In addition to the newspaper advertisement, outlined, the defendant at the sale displayed signs in its store which described the foulards it was offering as follows:

> "A Sensation! 22,000 yards Cheney's Twill and Showerproof Foulards $1.59. Less than today's wholesale cost."

It also appeared that the saleswomen in the employ of the defendant informed customers that the foulards on sale were of this year's pattern, and were ordinarily sold for $3.50. And further, it seems, the defendant had several tables on which were placed the Cheney foulards, and next to them was a table with foulards of other manufacture, though there was nothing to indicate they were of different manufacture.

Complainant, it appears, protested to the defendant upon the appearance of its first advertisement in which a sale of "Cheney's foulard silks less than wholesale cost," was announced, but defendant continued to advertise its sale. The complainant thereupon instituted the instant action to restrain the defendant for alleged unfair competition. After a review of the facts, as outlined, the court in rendering judgment, among other things, said:

WHAT THE COURT DECIDED.

"I think it clear that oral and written representations have been made that would induce a purchaser to believe that: (1) All foulards were Cheney's; (2) the foulards were Cheney's first quality; (3) the foulards were Cheney's latest patterns and colors. These representations were not true, and were most injurious and prejudicial to the complainant. * * * * *.

"Such advertising and such statements by the saleswomen in the store have been so widely diffused that no use of Cheney's name in connection with these foulards can fail to run the risk of being connected with the original misrepresentations. I think a preliminary injunction in broad terms should be granted as prayed for, together with an order enjoining defendant from using the words 'Cheney,' or 'Cheney silks,' or 'Cheney foulards' in advertisements, placards, or signs. The defendant may, however state to customers the name of the manufacturer, when inquiry is made."

It appears from the report that at the hearing the defendant attempted to justify its advertising on the grounds that it merely stated the truth in advertising the foulards as Cheney's. In answer to this contention the court, in part, said:

"Defendant's contention that the use of Cheney's name in advertising only states the truth is no answer to complainant's position. * * * * * When a person so misrepresents the quality of the goods of another as to lead the public to suppose that the goods are of a different quality from what is being sold, the use of the manufacturer's name may be restrained altogether, in order to prevent what is in effect a continued representation that the goods are other than they really are in fact. * * * * *"

In conclusion the court granted the injunction prayed for and enjoined the further advertising of the Cheney foulards as indulged in by the defendant. Holding, as outlined in the opinion, that the advertising of the defendant was injurious and prejudicial to the complainant manufacturer.

That the foregoing decision is right, both on reason and authority, will hardly be doubted; for, to permit a person to advertise the goods of a manufacturer, as the defendant did in this case, would be in effect to permit such person to tear down and damage a trade name or reputation that may have taken years to establish. And, as we have seen, this is not the law, and the manufacturer who is being wronged in this manner will find that he has an adequate remedy in court, should he decide to invoke it.

Sandoz
ANILINE DYES for ALL TRADES
SANDOZ

We carry a complete line at all branches

For Samples and Prices Apply at Any of Our Offices

SANDOZ CHEMICAL WORKS
INCORPORATED

238-240 Water St. NEW YORK
12 S. Front St. PHILADELPHIA
145 Brevard Court CHARLOTTE, N. C.
36 Purchase St. BOSTON
PATERSON

Tycos

temperature instruments

A *Tycos* Recording Thermometer gives accurate records daily of each kettle of size cooked. It eliminates guess-work and time-keeping in the size cooking room. There is a *Tycos* for every textile temperature problem. Our catalog shows them. Send today for our general industrial catalog.

Taylor Instrument Companies
Rochester, N.Y., U.S.A.
Theres a *Tycos* and *Taylor* temperature instrument for every purpose.

AUTO GYP
Process of Dyeing

Means MORE $$$ for YOU—

It is a recognized fact that the present day problem of every textile mill is—greater production at less cost.

Among the many important items in a cotton mill to be considered in solving the problem of greater profits—more real dividends,—is the dyeing and bleaching of goods.

Old methods of bleaching and dyeing are fast crumbling under the modern and proved AUTOGYP Process of Dyeing, which is revolutionizing the dyeing and bleaching of cotton goods, yarn, etc.

Autogyp bleaches and **dyes to** shade, uniformly, in ONE OPERATION of three hours time.

Among the many savings effected, which ultimately result in cash dividends, are:

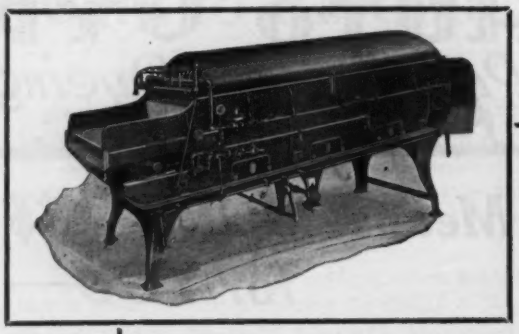
1. No special or additional equipment needed.
2. Saves boiling out in kiers.
3. Saves disagreeable bleach.
4. Saves 4 to 16 hours time.
5. Saves 6 steps and operations.
6. Saves 3½% of shrinkage.
7. Saves 25% of steam.
8. Saves 20% of labor.
9. Saves 90% of water.
10. Saves ALL CHEMICALS used in the Chloride of Lime method of bleaching.

Our staff of experts and fully equipped laboratory are at your service and disposal without obligation.

A letter brings a representative. Write us.

Surpass Chemical Co., Inc.
Albany, N. Y.

SURPASS CHEMICAL CO. INC. FORUSE IN AUTOGYP PROCESS OF DYEING
AUTOGYP
PATENTED IN U.S.A. SEP. 20, 1910 IN CANADA OCT. 10, 1916
ALBANY N.Y.



"Kinky Filling"

is an indication of antiquated methods. It is no longer tolerated by the modern mill man.

The SARGENT YARN CONDITIONING MACHINE is now replacing the old, wasteful methods of yarn conditioning. This is evidenced by the large number of mills now using this equipment.

The SARGENT YARN CONDITIONING MACHINE sets the twist, restores correct degree of moisture with utmost accuracy, rapidity, uniformity and thoroughness. Only **60 seconds** are required to produce the very best results.

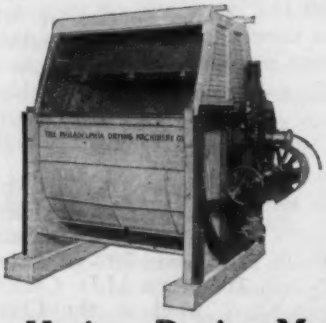
Have you investigated the SARGENT? If not, we shall be pleased to send you full details on request. Submit your requirements to us.

C. G. SARGENT'S SONS CORPORATION, GRANITEVILLE, MASS.

Fred H. White, Southern Agent, Charlotte, N. C.

SARGENT YARN CONDITIONING MACHINE

"HURRICANE"



Rotary Hosiery Dyeing Machines

If you dye or bleach hosiery it will pay you to investigate the many advantages of our latest type machine.

It is suitable for dyeing or bleaching cotton, mercerized, silk and artificial silk hosiery.

The tub is lined with monel and the pockets of the cylinder, which are also monel, are so constructed as to eliminate the use of dye nets, and will not tangle the goods.

Standard size machines—100 to 300 pounds.

See our display at Knitting Arts Exposition, Booths 249-250-251

The Philadelphia Drying Machinery Co.

Office and works: 3351 Stokely St. Philadelphia, Pa. Boston Agency: 53 State St.

DURABLE K-W UNIVERSALLY USED

KLAUDER - WELDON DYEING - BLEACHING- SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery, by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the "world's best dyeing, bleaching and finishing machinery."

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W Literature

THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent, Realty Bldg., Charlotte, N. C.

FLETCHER STEAM TURBINE DRIVEN EXTRACTORS

Have made good!

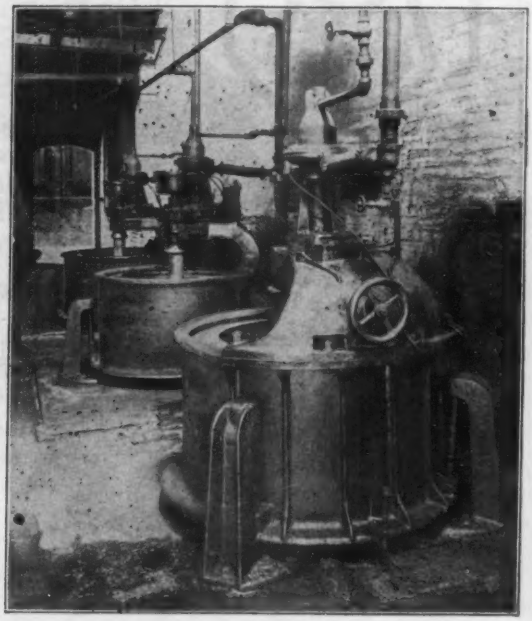
Read what one user says—

"The 48-inch steam turbine driven extractor you sold us September, 1921, works very satisfactorily.

"We have ordered, in the meantime, three more of the same machines, which we trust will give the same satisfaction."

(Name on request.)

Repeat orders are the best proof of satisfaction.



FLETCHER WORKS

FORMERLY SCHAUM & UHLINGER

Glenwood Avenue at Second Street

PHILADELPHIA, U. S. A.

Southern Representative:
HOWARD MORSHEAD, Glenwood Avenue and 2nd Street, Philadelphia, Pa.

FILTERS

PRESSURE GRAVITY

Especially designed to meet all requirements of Textile Mills.

Economical in upkeep.

Perfect satisfaction.

NORWOOD ENGINEERING CO.

Florence Mass., U. S. A.

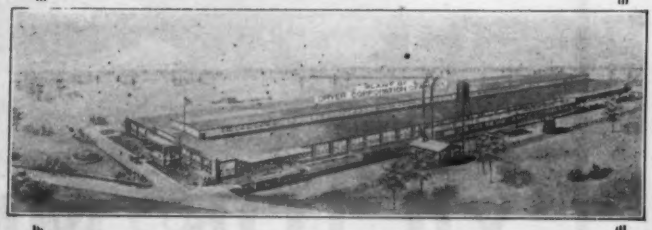
CHAS. M. SETZER, Southern Representative,

Charlotte, N. C.

Perfect Insulated Dryers

MILLER SYSTEM

Twenty-Five Years of Successful Operation



Automatic Truck and Tray Type Dryers for all textile fabrics. Drawn Steel frame members uniform in size, not formed by a break. The only dryers carrying 85% Magnesia insulation, which is the highest grade insulation manufactured. All joints between the frame and panels that form the inclosure are air sealed. This improved patented construction is found only in the Miller Dryers.

The story will be told in detail if you are interested.

Correspondence Invited

DRYER CORPORATION OF AMERICA

GENERAL OFFICES AND PLANT

Warren, Ohio

Chlorantine Colors

The conspicuous feature of the Chlorantine Colors is their *unusual fastness to light.* For level dyeing, where fastness to acid, alkali, rubbing and hot pressing are required—THEY ARE UNEXCELLED.

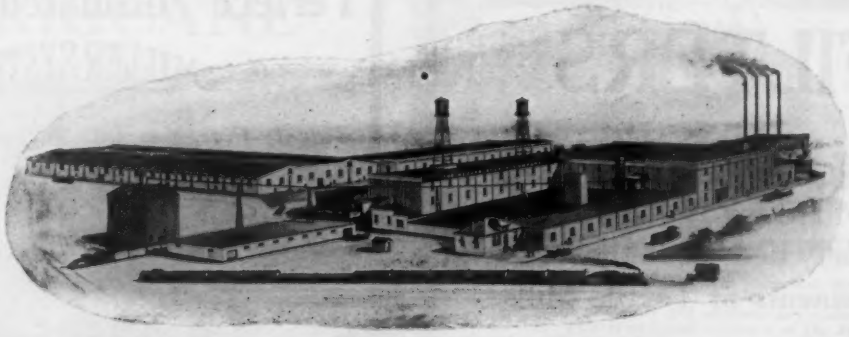
Recomended for application to all goods which must withstand the action of light, such as UPHOLSTERY GOODS, CASEMENT CLOTHS, CURTAINS, VELVETEENS, LINEN PLUSH, Etc.

Sole Selling Agents for Dow's Indigo and Midland Vat Blues

Sole Representatives
in the United States
for the
SOCIETY OF CHEMICAL INDUSTRY
IN BASLE
Basle, Switzerland

iba Co. Inc.
BRANCHES BOSTON PROVIDENCE
PHILADELPHIA CHICAGO
COLUMBUS, GA.
CEDAR and WASHINGTON STS.
NEW YORK

CIBA CO. LTD., Montreal, Canada



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

The Grasselli CHEMICAL CO.

ESTABLISHED 1839 CHEMICALS INC GRASSELLI EXPLOSIVES DYESTUFFS

Dyestuff Dept
117 Hudson St.,
New York, N.Y.

KATIGEN DEEP BLACK GGN CONC.

The Ideal Sulphur Black for Hosiery

The Grasselli line of sulphur colors offers a wide range of products suitable for raw stock, machine or piece dyeing.

Through the use of these colors practically all shades possible of production by the sulphur group may be obtained.

We also offer a full line of Algol and Developed Colors manufactured by

FARBENFABRIKEN VORM. FRIED. BAYER & CO.
Leverkusen

Shades matched and quotations furnished promptly.

Factories at

Rensselaer, N. Y.
Grasselli, N. J.

Branch Offices

Boston Providence
Philadelphia Chicago
Charlotte New Orleans
San Francisco

THE
GRASSELLI CHEMICAL CO., LTD.
TORONTO MONTREAL
CANADA

Sole Selling Agents

ESSEX ANILINE WORKS, INC.
Boston, Mass.

Established 1815

ARNOLD, HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

All Kinds of

HEAVY CHEMICALS

Sole Agents for

BELLE ALKALI CO.

of Belle, W. Va.

Manufacturers of

LIQUID CHLORINE
BLEACHING POWDER
CAUSTIC SODA

Solid and Flaked

We solicit your inquiry for prompt or future delivery

"DEVELOPENE"

Leaves No Argument as to When

"BLACK IS BLACK"

WHY BE SATISFIED

with a RUSTY BLACK when you can have a RICH LUSTROUS BLACK by finishing your Hosiery with the latest, most efficient and satisfying patented preparation.

"DEVELOPENE"

A Demonstration Will Convince You

Send us a pair of unfinished stockings, skein of yarn or a piece of fabric—cotton, silk, artificial silk, wool or mixes—which has been dyed black, washed, but not finished. We will finish it with "DEVELOPENE" and return to you.

There will be such an improvement that you will immediately want "DEVELOPENE" for finishing your goods.

No further softener—or soap—required. Makes hosiery slip on and off the board easily—leaves the product soft and pliable.

Kali Manufacturing Company

Manufacturing Chemists

1404-10 No. Front St. Philadelphia, Pa.

Sole Manufacturers of

Hydroxy Oil and Kali Chlorine Neutralizer

ISN'T IT SATISFYING?

After trying many different soap powders with fair success, you finally decide to try

SAVOGRAN

and find that it gives the best results with the greatest economy.

Why shouldn't it? It has been doing this for forty-eight years. You don't experiment when you deal with experience.

"ASK YOUR SUPPLY HOUSE"

Manufactured by

INDIA ALKALI WORKS

BOSTON, MASS.

Uniform in Application

VICTROLYN

Penetrating, Lubricating, Dependable Assistant in Warp Sizing

KLORASENE

will remove Oil Stains.

If you are troubled, write us.

BOSSON & LANE

Manufacturing Chemists

ATLANTIC, . MASS.

JACQUES WOLF & CO.

PASSAIC, N. J.

Manufacturers of Chemical Specialties for the Textile Mills

ALIZARINE ASSISTANTS .

CREAM SOFTENERS

HYDROSULPHITE .

MONOPOLE OIL
Reg. Trade Mark
No. 70991

GUMS
Arabic, Karaya, Tragacanth

"BRETON"
MINEROL "F"

For
Knit Goods

"It gives a silky feel"

BORNE, SCRYMSER CO.
Established 1874
80 South Street, NEW YORK
BOSTON **PHILADELPHIA**
Works: Elizabethport, N. J.

Staley's

Whether purchased in train load lots or single bags, Staley's Eclipse Thin Boiling starch is always the same, varying neither in quality nor results obtained.

Staley's Starch is accurately processed to the work it is required to perform. This is assured by the most scientific methods of control, maintained with the aid of plant and laboratory facilities that are the most modern and comprehensive in the textile industry. Write for samples and prices.

A. E. STALEY MFG. CO.
DECATUR, ILLINOIS
508 Andrews Law Bldg., Spartanburg, S. C.
J. W. Pope, Ansley Hotel, Atlanta, Ga.
25 Church St., New York City
88 Broad St., Boston, Mass.

Starch

NO reputation in business can be built more securely than a reputation built on quality products.

This is exactly what the Special Purpose Alkalies

Wyandotte Textile Soda
Wyandotte Concentrated Ash
Wyandotte Kier Boiling Special

are designed to assist you in establishing.

Softer feel, more even penetration of dyes insuring brighter colors, and quality appearance are factors in their economical work.

Ask your supply man.

The J. B. FORD CO., Sole Mnfrs.
WYANDOTTE, MICH.

Rohm & Haas Company

Manufacturers of

CHEMICALS

BRISTOL, PA. PHILADELPHIA, PA.

SODIUM HYDROSULPHITE—Sulphoxylates and allied Products.

Sodium Hydrosulphite LYKOPON
For reducing Indigo and vat dyes.
Of highest quality and absolutely standard.

FORMOPON EXTRA—For stripping.
PROTOLIN—For stripping.
INDOPON W—Indigo Discharge Assistant.

TARTAR EMETIC—Technical.

Represented by

The MAKENWORTH COMPANY

Greensboro, North Carolina

Chas. Lennig & Company

Incorporated

40 North Front Street Philadelphia, Pa.
Works: Bridesburg, Philadelphia, Pa.

Manufacturers of

Concentrated Sodium Sulphide

Crystal Sodium Sulphide

Also manufacturers of the following chemicals:

ALUM	GLAUBER SALT
SULPHATE OF ALUMINA—	OIL OF VITRIOL
Iron Free	NITRIC ACID
PAPER MAKERS' ALUM	MURIATIC ACID
WATER FILTRATION ALUM	NITRATE OF LEAD

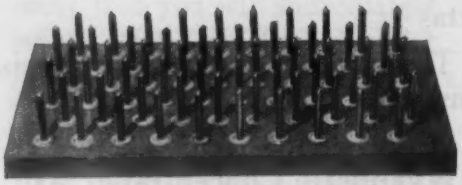
Represented by

The MAKENWORTH COMPANY

Greensboro, North Carolina

KORE-LOKT PIN BOARDS

REG. U. S. PAT. OFFICE



Patent Rights Pending

Are You Responsible

for good weaving in your mill? If so, you should know Kore-Lokt Pin Boards and the story of their usefulness in modern loom equipment.

Expert Opinion from men in charge of the weave rooms in prominent mills is available to superintendents and overseers upon request.

Send for this information so you may know the merits of Washburn Kore-Lokt Pin Boards as an improvement over old style Filling Boxes. Learn how the other fellow checks up results from the "Build of Bobbins."

NEW BEDFORD, MASS.

PERFECTION SHELL ROLLS

FOR

BLEACHERIES

BALL WARPING

FINISHING PLANTS

CORD FABRIC SHIPMENTS

NEW BEDFORD, MASS.

Are You In Need

of

Roller, Clearer and Slasher Cloth?

If so, let us send you a trial order in order to prove to you the real quality and satisfaction obtained in our products.

Our Roller Cloths are made of the right material with exactly the correct cushion and uniformity of surface to produce most desirable results.

Clearer Cloth is constructed of high grade material with thick, strong nap that does not pull out and its uniform length is such that the rolls are completely cleared of all short fibre.

Our Slasher Cloth is made of the best material of sufficient cushion and porous to thoroughly force the sizing into the yarn.

We want you to try our products if you are not already using them. Write us.

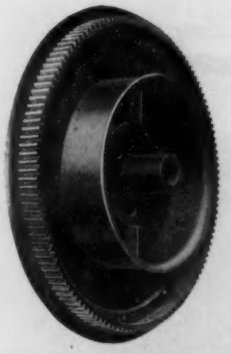
PHILADELPHIA FELT COMPANY

FRANKFORD, PHILADELPHIA, PA.

Southern Sales Agent: M. C. Sanders, Greenville, S. C.

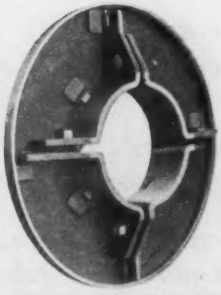
All Steel Loom and Section Beam Heads

Cannot Break
Do not Bend



"ALL STEEL" LOOM BEAM HEAD
"MALLEABLE" GEAR
Patent Pending

"ALL STEEL" SECTION BEAM HEAD
PATENTED



"ALL STEEL" ADJUSTABLE HEAD
SPLIT OR SOLID TYPE
PATENT PENDING

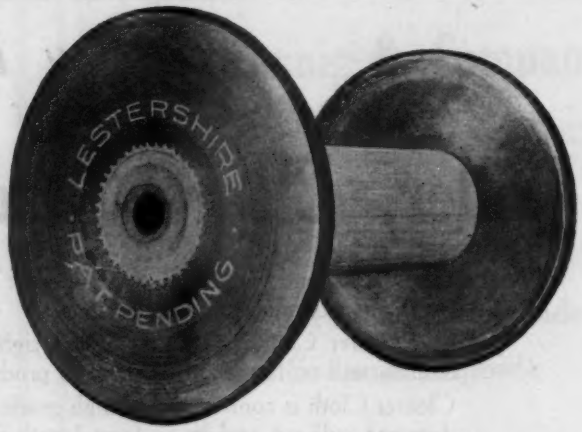
DUPLICATE YOUR CAST IRON HEAD IN STEEL — ELIMINATE ALL BREAKAGE
MAKE YOUR BEAM HEAD INVESTMENT PERMANENT

Mossberg Pressed Steel Corporation

Attleboro, Mass.

SOUTHERN OFFICE 201 AUGUSTA ST. GREENVILLE, S. C.

What Part of the Spool is First to Wear Out?



Your superintendent will confirm our statement that 99% of all Warper, Twister or Spooler Spools become useless on account of the heads breaking, wearing rough or loosening. This is true of all types of Spools heretofore on the market.

With the Lestershire Type Vulcanized Fibre Head Spools just the opposite is true. The Heads will outwear the barrels because Hard Vulcanized Fibre (the same material from which end thrust bearings and automobile gears are made) will never break, wear rough nor splinter.

Of course the first cost is higher but, figuring your charges per thousand spools per year, they are by far the most economical spools on the market today.

In addition Lestershire Fibre Head Spools will in the ordinary mill give you an increased unloading production of nearly 50%. Put a row on your creel and compare the time necessary to unload with any other type Spool.

On the smooth Rock Maple barrel, cleanly jointed to the Fibre Heads which cannot get rough and cannot be dented, there is no place for the yarn to catch.

Spindle wear is also eliminated by bushings of hard well seasoned Dogwood.

Increased traverse can be had which will give you greater yardage on your spools. This means a saving of many dollars in the course of a year, not only direct but in labor required to change the spools.

At your request we will gladly send samples for purposes of test and comparison.

LESTERSHIRE SPOOL & MFG. CO.

Manufacturers Mill Spools, and Bobbins, of Every Description

JOHNSON CITY, N. Y.

SPINNING RING SPECIALISTS
1873 – FOR FIFTY YEARS – 1923

SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH
TRAVELLER CLEANERS
TRAVELLER CUPS
GUIDE WIRE SETS

WHITINSVILLE SPINNING RING CO.
WHITINSVILLE, MASS.

SACO-LOWELL FLYERS
FOR ROVING FRAMES

A finished product of the highest quality. Made in our own shops by improved methods and tools. Thoroughly dependable and unconditionally guaranteed.

Interchangeable in every way with flyers formerly furnished. Uniform in weight with presser stiff and well balanced. Supplied in any size or quantity. Trial order solicited.

SACO-LOWELL SHOPS
IMPROVED TEXTILE MACHINERY

SHOPS AT

LOWELL, MASS. NEWTON UPPER FALLS, MASS. BIDDEFORD, ME.
Pawtucket Spinning Ring Co., Central Falls, R. I.
EXECUTIVE OFFICES: BOSTON, MASS.
ROGERS W. DAVIS, Southern Agent, CHARLOTTE, N. C.
Southern Branch Office: Greenville, S. C.

CORD FABRIC LOOM

The picture shows the Crompton & Knowles Cord Fabric Loom with Double Roll Independent Winder.

This loom weaves cloth 60" wide and with picks 2½ to 12 per inch as desired.

This is the standard weaving unit in the production of cord fabric for automobile tires. It is used almost exclusively throughout the United States in weaving the tremendous annual production of cord fabric.

CROMPTON & KNOWLES LOOM WORKS
WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.
ALEXANDER & GARSED, CHARLOTTE, N. C.
Southern Representatives.

Quality in Shuttles

If ever, material, workmanship, economy, and all round experience were compressed into a product they are in the Williams Shuttle. No essential details are omitted. Most shuttles look alike, but—how long will they stand up? Remember there is much in Promise, and much more in performance, namely: —more production, quality goods, less waste, employee good will. Comparing price and quality is most beneficial to us. We like to trade with the buyer who feels that he has not one cent to squander in buying shuttles. Our product is cheap, but not cheap goods, and our interest and responsibility lasts long after we have sold you the goods.

THE J. H. WILLIAMS COMPANY

"The Shuttle People"

MILLBURY, MASS.

Geo. F. Bahan, Southern Representative

VERMONT SPOOL & BOBBIN CO.

OF

BURLINGTON, VERMONT.

There are two prime requisites in the production of superior bobbins and spools—the plant and long experience. We have both.

Our plant is equipped with the most up-to-date and efficient machinery. From the selection of the wood to the finishing of the product the same care is exercised in every department—uniform bobbins and spools of the highest class being the result.

Our long experience in the design and manufacture of spools and bobbins for textile mills all over the country enables us to understand your requirements and give you 100% satisfaction.

Give us a trial order and you will remain one of our satisfied customers. Write for prices.

"Good Goods at Fair Prices."

MONEY

Factor No. 2

AMPLE financial resources — permitting us to erect and equip what we believe to be the most modern shuttle factory in the country. Resources giving us a cash buying power that impels those from whom we buy to make prompt shipments.

Here is the second of the 4 factors that assure

Prompt Delivery
to the Users of Shambow Shuttles

4 FACTORS
Men
Money
Material
Machinery

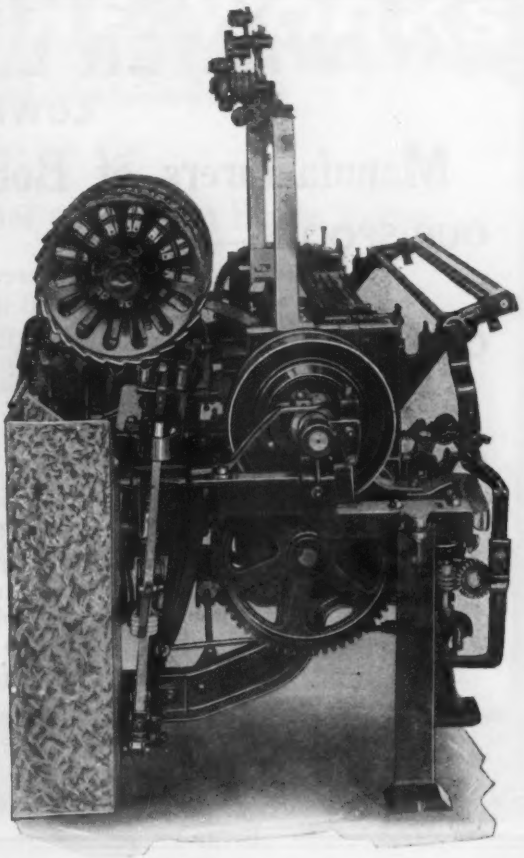
HEART OF THE LOOM

Shambow Shuttle Co.

JOHN C. SHAMBOW, Pres. & Treas. — H. H. ULLMAN, V. Pres. & Gen. Mgr.

8 Winter St., Woonsocket, R. I.

Philadelphia, 421 Bulletin Bldg. — Paterson, N. J., 245 Straight St. — Greenville, S. C., Southern Factory



The Latest

NORDRAY

Automatic Loom

Multiple-harnesss, Feeler type

built by

HOPEDALE MANUFACTURING CO.

at MILFORD, MASS.

SOUTHERN OFFICE at
GREENVILLE, S. C.

This loom was shown at the Late Greenville Exposition and excited great interest.

It is Still the Simplest.

WALTER L. PARKER CO.

LOWELL, MASS.

Manufacturers of Bobbins, Spools and Skewers

OUR SPOOLS:—

Are made to stand severe service and are made from thoroughly dried stock, so constructed that they are giving entire satisfaction.

OUR BOBBINS:—

Are made from the best grade of stock, and through the efficiency of our workmanship, are true running, and properly fitted on spindles.

OUR PRODUCTS:—

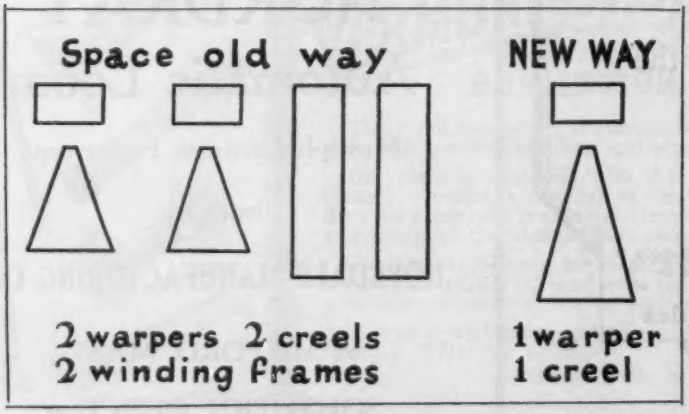
Bobbins—Warp and Filling. We put on all kinds of metal shields and caps.
Speeders—Plain; steel rings; metal base.
Spools—Warper; Twister.
Our Metal Bound Spools are pronounced the best on the market.
Skewers—Cop, Warper and Roving, of all descriptions.
Twisters—Universal Winder Rolls and Bobbins, Comber Rolls, etc.

We Specialize in New Mill Equipment

CHARLOTTE SUPPLY CO., SOUTHERN AGENTS.

NEW AUTOMATIC CREEL

for direct warping from FILLING WOUND BOBBINS



COMPLETELY ELIMINATES the

Spooling of the yarn

Spooling waste

Undue and irregular tension of yarn due to spooling

Stoppage for doffing

Doffing is done while warper is running.
Greater production from better warps at lower cost.
Better loomage from auto-creel warps because
Elasticity is preserved in yarn.

For Information address

AUTO CREEL CORPORATION, NEW YORK

Room 915, Fifth Ave. Building
Alfred Suter, Sales Manager

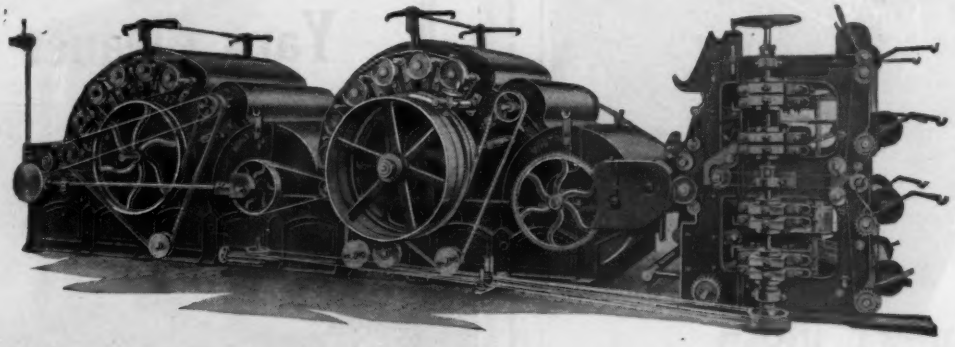
WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY

MANUFACTURERS OF

Complete Condenser Plants for Wool and Cotton Waste Yarns

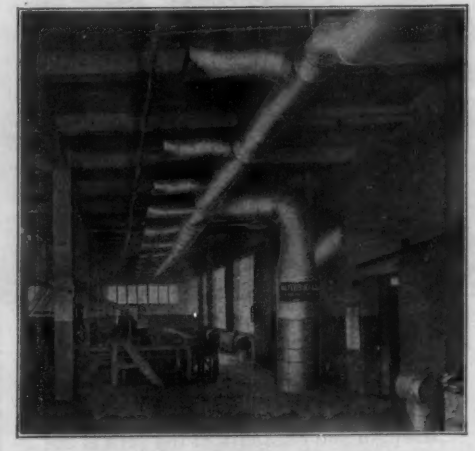


Intermediate and Finisher Cards with Four-Bank Condenser

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.



Engineering

Placing your problems in the hands of this organization, gives you the benefit of all the experience of the foremost engineers in the country on air conditioning systems.

These specialists who are nationally known and recognized, have made air conditioning their life study.

They will be glad to refer you to an installation near you or give you the names of concerns in your own business who have successfully installed our air conditioning systems. You may then get in touch and understand why Sturtevant-Fleisher Systems are preferred.

Whatever your problems or conditions, these engineers who have installed hundreds of systems all over the country, will be glad to cooperate with you.

Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Hartford, Los Angeles, Minneapolis, New York, Philadelphia, Pittsburgh, Portland, Rochester, St. Louis, Salt Lake City, San Francisco, Seattle, Washington

Sturtevant

PUTS AIR TO WORK

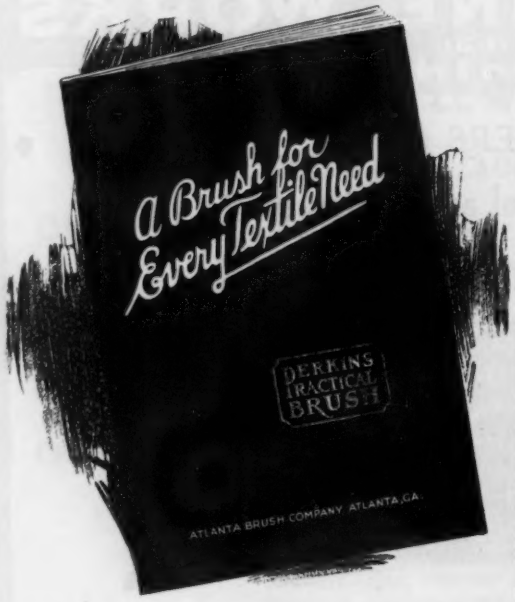
Hyde Park, Boston, Mass.

W. L. FLEISHER & CO., Inc.

31 Union Square West

New York, N. Y.

727



The book is yours for the asking

It is probably the most complete catalog, devoted entirely to textile brushes, that was ever published.

Also, it is unique in that every brush shown within its pages is from an actual pen drawing, made direct from the object.

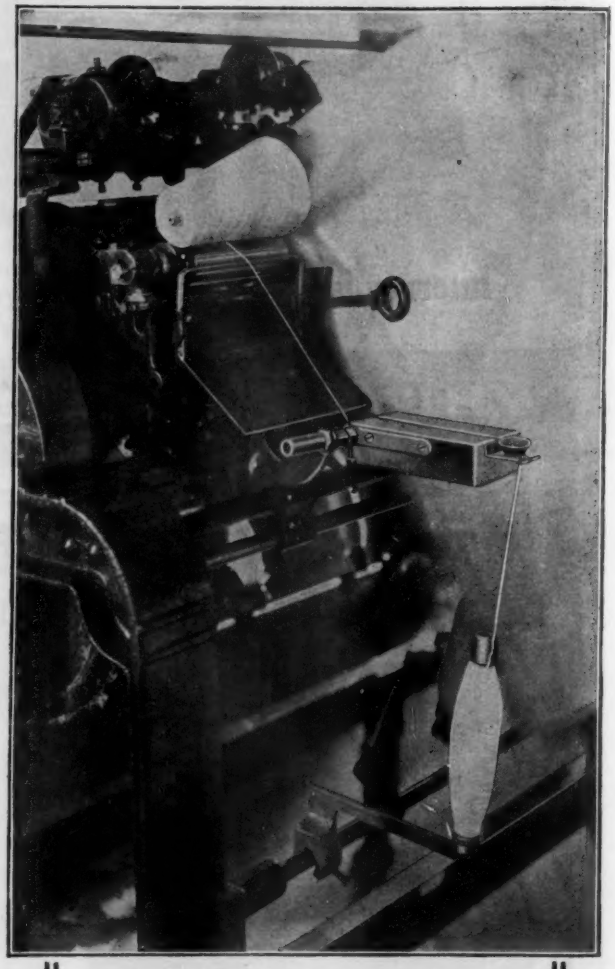
Much time was required in producing the book, but it is worth the cost, for it embraces, as the cover denotes, "*a brush for every textile need.*"

This catalog rightly belongs in the files of every mill executive. It will prove a ready reference for every superintendent. The purchasing agent, or department, will want a copy, of course.

It is now ready for mailing. *The book is yours for the asking.*

Atlanta Brush Company
Atlanta, Ga.

The
ECLIPSE
Automatic Yarn Cleaner



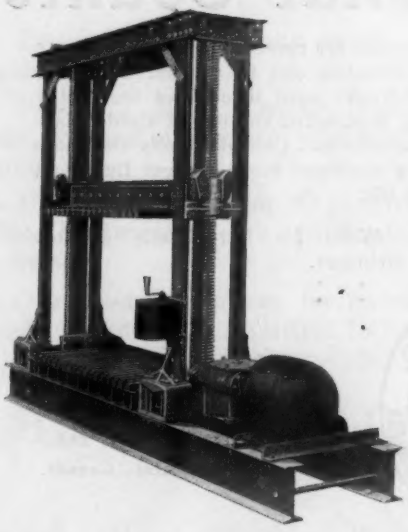
AN entirely new principle is involved in that the yarn is cleaned by flexible blades which vibrate **constantly.** This device is small and compact and easily attached. The strength and elasticity of the yarn is not affected in the slightest.

When writing state make of spooler or winder.

Eclipse Textile Devices, Inc.
Elmira, N. Y.

Another

REX PRESS



New Cloth Press

Speed, Strength, Simplicity

Built any size and pressure.

The Rex Creed

To build a press so good that the simple truth about it will be adequate recommendation and to price it so fairly that its value can never be questioned.

Watch for the Yarn Press.

REX ENGINEERING CORPORATION

Dunkirk, N. Y.

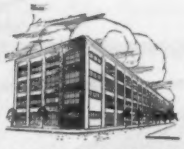
J. S. HULME

Southern Representative

Atlanta Trust Co., Bldg.

ATLANTA, GA.

A Scrubber With Eight Hands!



EDISON LAMP WORKS
Newark Plant
One of the several plants of this company where CLEAN FLOORS are maintained by the FINNELL SYSTEM

No human hands, these to tire and shirk! No man or woman on hands and knees wields these brushes! Sheer muscle could not put 60 pounds pressure back of them. No human could send them whirling around at 125 revolutions per minute.

Best of all, there's no pail of dirty water to be slopped on the floor and then mopped off, but a constant shower of CLEAN water from the tank above the scrubber—CLEAN water for every square inch!

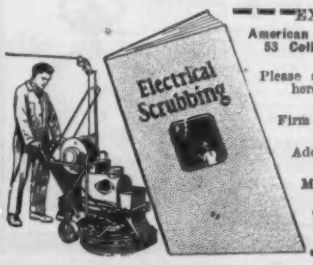
Electricity does it! Electric scrubbing is here to stay. Send for booklet shown below—the story of electric scrubbing.

AMERICAN SCRUBBING EQUIPMENT SALES CO.

General Offices and Factories
HANNIBAL, MO.
District Offices in Principal Cities

"Clean Floors Reflect Clean Business"

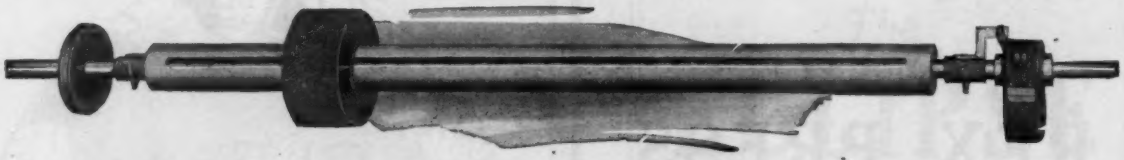
FINNELL SYSTEM
OF ELECTRIC SCRUBBING



EXECUTIVE'S MEMO.
American Scrubbing Equipment Sales Co.
53 Collier St., Hannibal, Mo.

Please send brochure shown here to

Firm Name.....
Address .....
My Name.....
Title .....



It's Experience That Counts

Years of study and a brain packed with theory has never yet made any man highly successful in his line. It's experience that counts.

And it's experience that counts in making successful machines. It takes not only study but it takes long years of experience and experimenting to make any machine perfect.

Roy Grinding Machinery has been made since 1868 and these long years of experience are responsible for the success of Roy Grinders and the reason why they are universally used throughout the textile industry, prolonging the life of Cards, Nappers, Garnetts and Calender Rolls and making these machines more efficient througout a longer life.

Write for full details of Roy Grinders.

B. S. Roy & Son Co.
E. M. Terryberry, Southern Agent
1126 Healey Bldg.,
Atlanta, Ga.

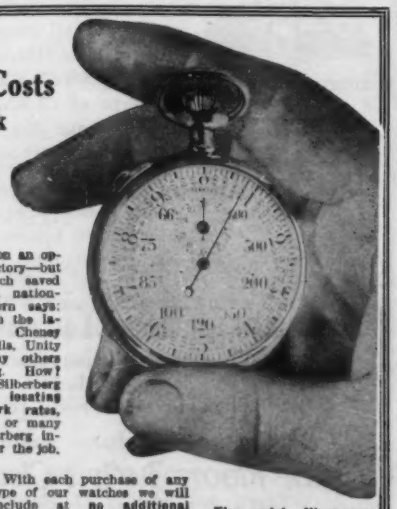
B. S. ROY & SON CO. MADE IN AMERICA TEXTILE GRINDING MACHINERY WORCESTER, MASS. U.S.A. SHIPPED THE WORLD OVER

Worcester, Mass.
Canadian Representative:
W. J. Westaway, Ltd.,
Hamilton, Ont., Canada.

Established 1868

Obtain Standardized Costs Set Piece Work Rates

Here's the Watch for Every Textile Time Study Job



Only six seconds waste on an operation in an eastern factory—but locating it with the watch saved thousands every year. A nationally known Textile concern says: "We eliminated one-fourth the labor, cut costs by 22%." Cheney Bros., Champlain Silk Mills, Unity Spinning Mills and many others are doing the same thing. How? By Time Studies with Silberberg watches. Whether it's locating wastes, setting piece work rates, establishing bonus systems or many other uses—there's a Silberberg instrument specially made for the job.

The Decimal Duration Watch—Gives production figures up to three minute jobs with special arrangements for timing jobs up to 30 minutes. It also has the decimal dial and "take out time" feature

With each purchase of any type of our watches we will include at no additional charge one set consisting of our 3 Text Lesson Course on "TIME AND MOTION STUDY" including how to set Piece Work Rates and how to obtain accurate Labor Costs. All data contained therein broadens the scope and use of Time Study Watches in the Industries.

This course regularly sells for $10.00. Absolutely FREE with each Watch. Send for illustrated pamphlets and catalogues. Any of our instruments on approval to responsible concerns.

MORTIMER J. SILBERBERG CO.
Peoples Gas Bldg.
CHICAGO
Pioneers in the Manufacture and Sale of Time Study Watches.

The watch illustrated at the top with the decimal dial and "take out time" features gives direct readings in production per hour up to one minute jobs.

The Master Chronograph

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY
Middletown, - - - Connecticut

LYON
STEEL PRODUCTS

FOR THE
TEXTILE
INDUSTRY

Designed to fit your exact requirements.

Shelving, Bins, Trucks, Tables, etc., worked out by practical textile men.

Built to the Lyon Standard—fixed by twenty years of industrial service.

Our District Offices have complete engineering facilities to handle your specific requirements.

Typical Lyon Shelving installation in a Textile Mill.

LYON METALLIC MANUFACTURING CO.
Aurora, Illinois
District (Sales) Offices
New York Chicago Philadelphia Pittsburgh Cleveland Indianapolis Los Angeles Boston Detroit Rochester

This is the Re-Fil-It Broom for general factory and mill sweeping, outside the Spinning Room in Textile Mills.

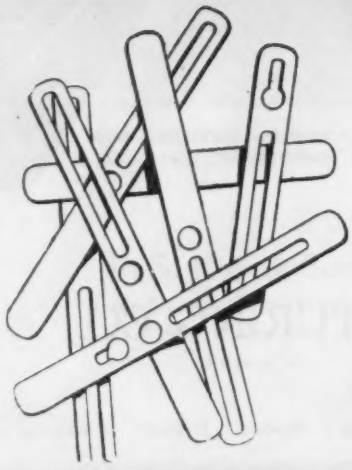
This is the Re-Fil-It Textile Special, the most practical sweeper for the Spinning Room.

Both
Spell
Economy

Write us for prices and particulars.

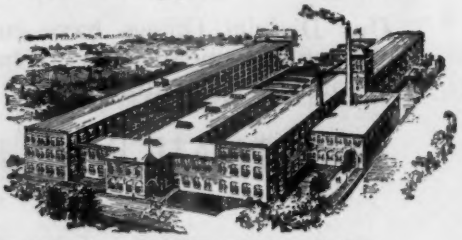
Re-Fil-It Broom Manufacturing Co.
185 Devonshire St., Boston, Mass.

GREIST



Satin Finish Loom Drop Wires
are *Good Wires*

Uniformly made—free from burrs.
A reliable source of supply.



The
Greist Manufacturing
Company,
Dept. "C"
New Haven, Conn.

Southern Representative
SLAUGHTER-McCABE COMPANY, INC.
GREENVILLE, S. C.

REEDS

For Cotton, Woolen, Worsted, Silk, Tire Fabrics, Webbing, and Wire Cloth.

We make a specialty of all Metal reeds, for Tire Fabrics, and Leno work.

HAYES LOOM REED & HARNESS CO.
182 Farm St. Woonsocket, R. I.

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

MANUFACTURERS OF
Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity.
None too small to receive careful attention.

JOHN PHILIP SOUSA

"I consider the excellence of complete Conn equipment enhances the musical value of any band to a marked degree."

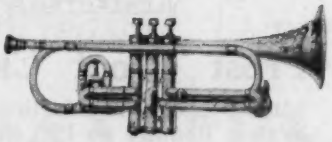
—Sousa.

Conn Instruments Make a Successful Band

REMARKABLY easy blowing combined with their superior quality of tone, perfect scale, and reliable action make Conn instruments the best for factory, institution, and community bands, just as they are for the great professional concert bands and symphony orchestras.

Complete equipment of Conn instruments insures rapid progress and gives a harmonious tonal effect obtainable in no other way. The world's great soloists and conductors join Sousa in endorsing the quality of Conn instruments and the exclusive features which make them easiest to play.

Complete Sets at Reasonable Prices



Conn will gladly help organize a band or orchestra for you. Our experience of half a century in building instruments and assisting in the organization of bands is at your service without obligation.

The Conn factory is the largest of its kind in the world—employs more men than all similar factories in America combined. Conn instruments have won highest honors at all world expositions beginning with the Columbia in 1892.

More Conn saxophones are sold than any other make in the world.

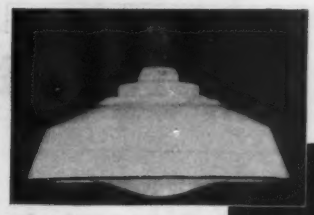
Write for information.

Get details of our special propositions for factory and community bands, without obligation to you.

C. G. CONN, LTD.

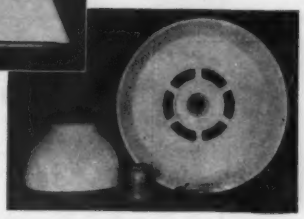
315 CONN BLDG., ELKHART, IND.

World's largest manufacturers of band and orchestra instruments.



An unassembled view of the IVANHOE Glassteel Diffuser

The IVANHOE Glassteel Diffuser equipped with a cast aluminum holder



Something New for Textile Lighting

THE IVANHOE Glassteel Diffuser is the most notable development for textile mill lighting since the introduction of the RLM reflector. We recommend it for high grade lighting where you desire to approximate daylight conditions. When lighting of less intensity is satisfactory, use the IVANHOE RLM reflector.

The IVANHOE Trojan, a highly efficient unit of moderate price for the correct illumination of offices, school rooms, churches, community halls, etc.

The Glassteel Diffuser has high efficiency with increased illumination on the vertical surface, excellent appearance, produces soft shadows, practically no direct glare, and a minimum of reflected glare. It consists of a glass globe which totally diffuses the light, and a white porcelain enameled reflector through the apertures of which some light is directed upward. It is made in two sizes, with 18-inch and 20-inch reflectors, and uses standard clear bulb lamps.

Near you is an IVANHOE distributor who will be glad to advise you about your lighting and to recommend what is best for you. See him at once, or write to us direct.

IVANHOE-REGENT WORKS *of General Electric Company*
Cleveland : : : : : : : : : : Ohio

"SERVICE TO LAMPS"

IVANHOE

GLASS SHADES—STEEL REFLECTORS

Counts 'em Right

Good-bye Guess Work

Good-bye Inaccuracy

The Productimeter

The minute you put a Productimeter on a machine you can bid guess work good-bye. It tells at a glance exactly what every man and what every machine is producing. Then, too—it will speed up production because the good workman wants to beat yesterday's record, and that establishes standards for all the rest of the force to follow.

Let us put a Productimeter on one of your machines for a month's trial. You'll see the difference almost from the start.

(1611-A)

DURANT Manufacturing Company

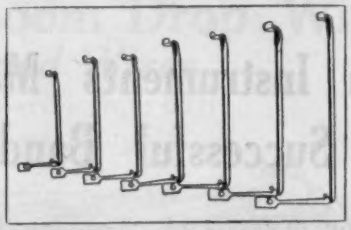
633 Buffum St. Milwaukee, Wis.

—and you'll increase your production.

Are your production costs high because of defective, worn out machinery?

The overhauling of your machines raises the efficiency of your mill.

In manufacturing, overhauling and repairing machinery for textile mills, we have constantly shown that we know how.



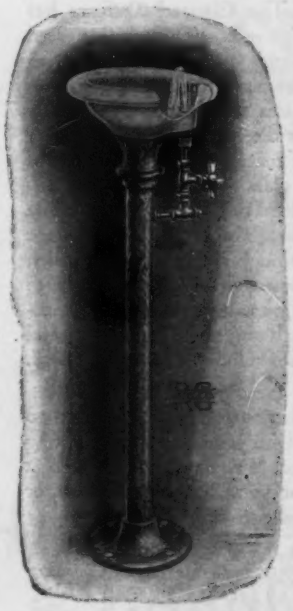
We manufacture all size flyer pressers and duplicate any style made.

Southern Spindle & Flyer Co., Inc.

Charlotte, N. C.

Manufacturers, Overhaulers and Repairers of Cotton Mill Machinery

W. H. MONTY, Pres. & Treas. W. H. HUTCHINS, V. Pres. & Sec.



Productive Labor

must be surrounded by time-saving health-promoting working facilities. Why permit 50 men to waste 1,000 hours a year walking to and from drinking hydrants? This is only 4 minutes a day per man—but in a year amounts to the price of

VERTICO-SLANT Drinking Fountains

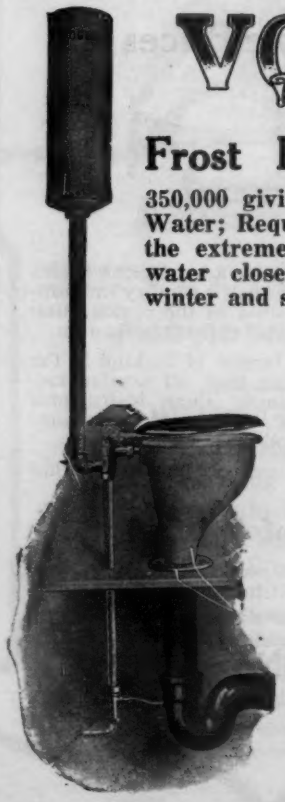
These fountains are simple, permanent, foolproof, disease-proof, and healthful. Employees drink freely, yet lose fewer days from contagious colds, grippe, influenza, and other fevers contracted from cups and spigots.

Vertico-Slant Fountains throw streams at an angle. This rids them of that oily, germ-laden film that dances at the top of a vertical stream.

Write for 70-page Drinking Fountain Catalog "C."

RUNDLE-SPENCE MFG. CO.

MILWAUKEE, WIS.



VOGEL PATENTED

Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

- Enameled Roll flushing rim bowls.
- Heavy brass valves.
- Strong hardwood seat.
- Galvanized tank.
- Malleable seat castings will not break.
- Tested under hydraulic pressure before leaving factory.

ASK YOUR JOBBER

JOSEPH A. VOGEL CO.

WILMINGTON DELAWARE

TRADE MARK

LOWELL MILL CRAYONS

the original crayons for textile mill use, and for years the standard with America's leading mills.

Lowell Crayons are made in white and 15 colors, as follows:

1	2	3	4	5	6
Yellow	Red	Pink	Blue	Purple	Brown
7	8	9	10	11	
Black	Green	Orange	Dark Green	Light Red	
12	13	14	15		
Rose Pink	Light Green	Light Blue	Orange No. 2		Wh.

Order by number, please.

LOWELL CRAYON CO.
Lowell, Mass.

Give Them Sanitary Washbowls

When you consider the low cost of installing the really best kind of washing-up equipment, you will want to know more about MEECO Individual Sanitary Washbowls.
Made single and double in batteries of any number. For 15 years the Standard Mill and Factory Washbowl.

Write Today for Catalogue and Prices.

Lockers
Chairs
Drinking Fountains

METAL MEECO PRODUCTS

Shelving
Partitions
Boxes and Cabinets

Manufacturing Equipment and Engineering Co.
BOSTON, MASS.

An Ever *Increasing Demand* For "AMTEX"

SPINNING, TWISTING AND SPOOLER TAPES

From

Southern Spinners

THE QUALITY AND PRICE RECOMMEND THEM

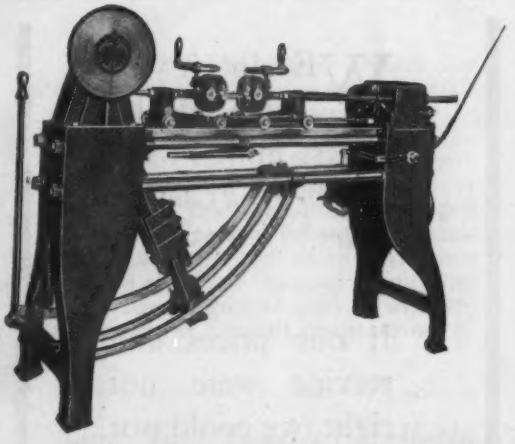
Manufactured by

AMERICAN TEXTILE BANDING CO., Inc.

GERMANTOWN, PHILADELPHIA, PENNA.

Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
James Supply Co., Chattanooga, Tenn.
Montgomery & Crawford, Spartanburg, S. C.

SCOTT TESTERS



THE SCOTT HORIZONTAL 800 LBS. CAPACITY—INCLINABLE BALANCE FABRIC TESTER

An American Invention, Built in America by Skilled American Mechanics and adopted as the Standard for testing all heavy fabrics for American requirements.

We also build the Standard Testing Machines for Light Fabrics, Yarns, etc.

HENRY L. SCOTT & CO.
BLACKSTONE & CULVER STS., PROVIDENCE, R. I.

A Variety of Work

on the same machine

In addition to business correspondence the modern office has a large variety of work for the typewriter.

Tabulating, billing (simple and condensed), stencil cutting, including Elliott and Belknap stencils, writing on ruled lines and many other kinds of office work can be done on the L. C. Smith & Bros. Typewriter.

The decimal tabulator and the variable line spacer are part of the inbuilt service of every L. C. Smith & Bros. Typewriter.

Send for free Catalog.

L. C. Smith & Bros. Typewriter Co.

Home Office and Factory : SYRACUSE, N. Y.

Branches in all Principal Cities.

General Electric

Distributing Jobbers

Complete lines of Wire, Switches, Safety Switches, Wiring Devices, Fuses, Edison Mazda Lamps and other electrical materials carried in our Atlanta and Savannah warehouses ready for immediate shipment.

Quick Service

Carter Electric Co.

(WHOLESALE)

21 Haynes St. Atlanta, Ga.

PRINTING

WE do it for some of the largest mills in the South—*Why not for yours?*

If our prices and service were not right, we could not do it.

THE A. J. SHOWALTER COMPANY

Dalton, Georgia.

Send for FREE story

Interesting, illustrated folder "How to get Greater Desk Efficiency" shows how to keep your desk cleared for action. Thousands of Kleradesks are giving entire satisfaction. Saves time locating, distributing or sorting papers. Takes less space than a tray. Sent FREE trial.

Kleradesk

Mailing Lists

Will help you increase sales

Send for FREE catalog showing details covering names of your best prospective customers. Counts and prices are given on thousands of different Mailing Lists.

99% Guaranteed by refund of 5¢ each

ROSS-Gould Co 318 10th Street St. Louis

Your Electrical Problems??

Whatever your electrical problem, be it the entire installation of the electrical system throughout mill and mill village, the solving of lighting problems, the installation of motors, down to the small repair or the installation of a switch, when you call in the Walker organization you can feel safe that the work will be done right by experts and that the installation will be a permanent investment.

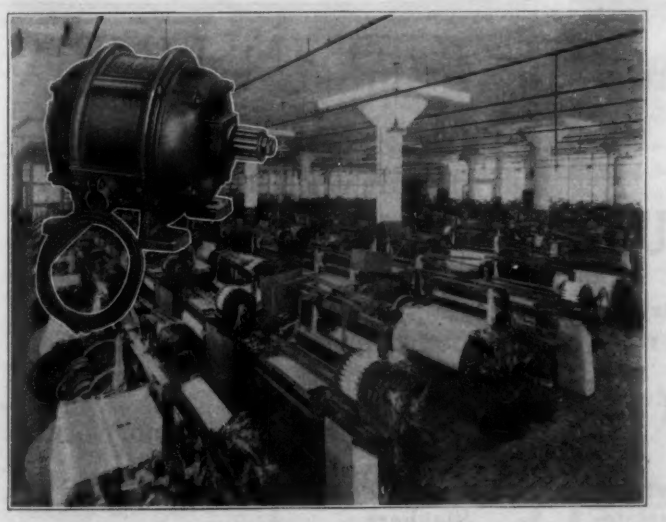
Many of the largest mills in the South vouch for Walker service, including such mills as Massachusetts Mills in Ga., Indian Head Mills of Alabama, Meritas Mills, Durham Hosiery Mills, etc.

When you have electrical, plumbing or heating problems to be solved, remember that satisfaction and economy can be secured with Walker Service.

Conduit Wiring in One of the World's Largest Concrete Textile Mills.

WALKER ELECTRIC & PLUMBING CO
ATLANTA, GEORGIA.

Branch Offices at Convenient Points Throughout the South



An Installation of 160—½-H.P. Loom Motors in a Southern Cotton Mill.

Some recent orders

102—½ H.P. "ARL" Motors, Victory Mfg. Co., Fayetteville, N. C.
266—½ H.P. "ARL" Motors, Dover Mills Co., Shelby, N. C.
130—½ H.P. "ARL" Motors, Miller Cotton Mills, Waco, Texas.
62—½ H.P. "ARL" Motors, C. Roberdel Mfg. Co., Entwistle, N. C.
118—½ H.P. "ARL" Motors, C. Cannon Mfg. Co., Kennapolis, N. C.

Loom Motors

Allis-Chalmers Loom Motors for individual drive are designed especially for this class of service.

They are totally enclosed, thereby eliminating any trouble for dirt or lint getting into the motor; equipped with waste packed bearings, minimizing the required attention; have tapered shaft for the ready mounting and dismounting of pinions and are arranged for conduit connections.

Send for Textile Bulletin

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN. U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

No material yet devised for distributing electric current in textile mills and industrial establishments equals

REALFLEX

in the matter of efficiency and economy. This steel-armored cable is exceedingly flexible, durable and convenient, as well as thoroughly safe. It can be had in many different sizes for carrying different loads, and meets the requirements of electrical codes so thoroughly that its use is practically an insurance against trouble from inspection or from other sources.

Ask your jobber for REALFLEX if you want to use the most efficient and economical steel armored electrical cable.

The Youngstown Sheet & Tube Co.

Youngstown. Ohio

District Sales Offices:

BOSTON—120 Franklin St.
NEW YORK—30 Church St.
PHILADELPHIA—Pennsylvania Bldg.
ATLANTA—Healey Bldg.
PITTSBURGH—Oliver Bldg.
CLEVELAND—Leader-News Bldg.
DETROIT—Dime Savings Bank Bldg.
CHICAGO—McCormick Bldg.
ST. LOUIS—1139 Olive St.
DENVER—First Nat'l Bank Bldg.
DALLAS—1401-2 Magnolia Bldg.
SAN FRANCISCO—604 Mission St.
SEATTLE—Central Bldg.

CONCRETE — DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN. — PERMANENT

MR. TAXPAYER—YOU!

Do you want your country to spend YOUR good money on roads that will wear out before your bonded indebtedness is liquidated?

I SAY YOU DON'T.

What you want is a hard-surfaced road, with little cost for maintenance—a road that can be traveled in rain or snow, summer and winter. You want a PERMANENT road—that means CONCRETE!

Write for Literature—It's Free

DIXIE PORTLAND CEMENT CO.

CHATTANOOGA, TENN.

GET IN LINE—

Where the breaking strength of the yarn is a matter of importance Mill men are equipping their Slasher Cylinders with Ball Bearings.

Let us quote you on our Ball Bearing Truck Rollers. We have the easiest and most satisfactory method of applying ball bearings to Slashers.

A set will convince you.

AldricH MachinE Ball WorkS Bearings

Greenwood, S. C.

WHEN the production sheet comes in, what does it tell you about your electrical equipment? Is the entire system working full time, giving uninterrupted service? Do you realize the cost of a breakdown in a motor driven machine, or an interruption in the lighting system? Do you know what your repair costs run into—the cost of repair parts, plus the labor cost, plus the lost production while idle, plus the cost of some confusion in starting up again?

Maintenance cost is an important item in the installation of an electrical system, and Huntington & Guerry Electrical Installations prove the most economical in the long run because maintenance costs are greatly reduced.

HUNTINGTON & GUERRY
INCORPORATED
GREENVILLE, S. C.

HUNTINGTON & GUERRY TROUBLE PROOF ELECTRICAL INSTALLATIONS

H & G TROUBLE-PROOF ELECTRICAL INSTALLATIONS

Like Coating Your Walls With Cement

When you paint the walls and ceilings of your mill with "ZEMCO-LITE" it is like putting on a coating of pure white cement. "ZEMCO-LITE"—the Cement Paint—will not crack off, peel or chip, is permanently WHITE and is unaffected by weather or mill conditions. Gives lasting satisfaction on wood, metal, stucco, brick or concrete surfaces. A paint for every purpose.

Let us submit our prices on ZEMCO-LITE Mill White and mill village paints. We have a color card which shows all the colors, Portland White, Stone Gray, Colonial Buff, Iron Red, Metallic Brown, Serpentine, Bronze Green, Delft Blue, etc. A complete line—and all are cement paints. Where shall we send your color card?

Zemco-lite
TRADE MARK
"The Cement Paint"

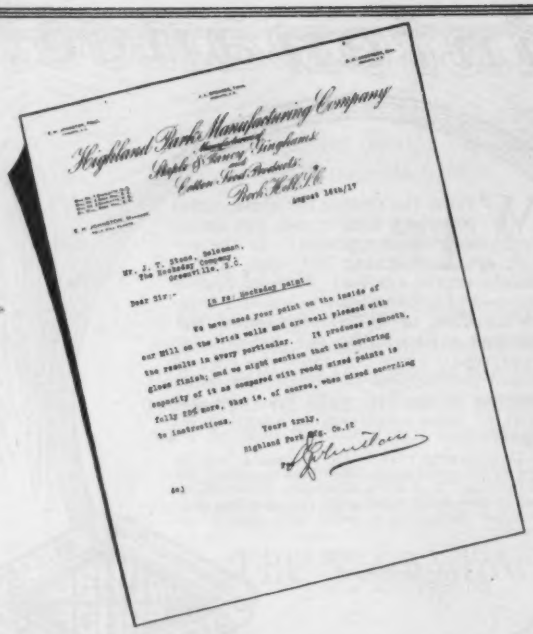
Our aim is to give our customers the utmost in quality, durability and economy—and we do not believe that a cotton mill could make a better paint investment than "ZEMCO-LITE." Our paint experts are anxious to help solve your paint problems. Call on us.

The Whitest of Whites

"ZEMCO-LITE" holds its own in any test of durability or whiteness. It is known in the textile field as the "whitest of whites." That's because of its aggregate of White Portland Cement. Put on *White* and *Stays White*. It is mixed with water—like cement.

AMERICAN CEMENT PAINT CO.
Chattanooga, Tenn.

"CEMENT FOR PERMANENCE—WHY NOT ZEMCOLITE?"


Highland Park Manufacturing Company
Duck & Fancy Ginghams
Cotton Yarn Products
Rock Hill, S. C.
August 14th/19

Mr. J. T. Stone, Salesman,
The Hockaday Company
Greenville, S. C.

Dear Sir:-

In re: Hockaday paint

We have used your paint on the inside of our Mill on the brick walls and are well pleased with the results in every particular. It produces a smooth, glass finish; and we might mention that the covering capacity of it as compared with ready mixed paints is fully 20% more, that is, of course, when mixed according to instructions.

Yours truly,
Highland Park Mfg. Co.#2
By J. Johnstone

Dollars and Sense Talk

Figures don't lie—consider these:—

$1.50 of labor with $1.50 of HOCKADAY will produce a job that will last 10 years or longer.

Think this over. Compare it with the cost and life of other paints. Then you will realize why Hockaday is inevitably the most economical covering you can put on your walls!

Here are only a few of the advantages you can obtain by using Hockaday:

Only two coats are needed in color—no size—no primer.
Saves at least one-third labor and one-third material.
Spread ten to fifteen per cent further.
Takes less time to apply—no brushing required.
Is really washable.—Can be relied upon to prevent peeling, checking, suction and lime burning.

Did You Get Your Copy?

Our new book "Solving Your Painting Problems" is now ready for distribution. It's brim full of striking facts and illustrations. If you are at all interested in paint, send for it at once. It's free.

THE HOCKADAY COMPANY
1823-1829 CARROLL AVENUE CHICAGO
O. H. Johnson, Mgr. Southern Branch.
Office, Newberry, S. C.

HOCKADAY
THE WASHABLE FINISH FOR ALL INTERIORS

Photo Underwood & Underwood.

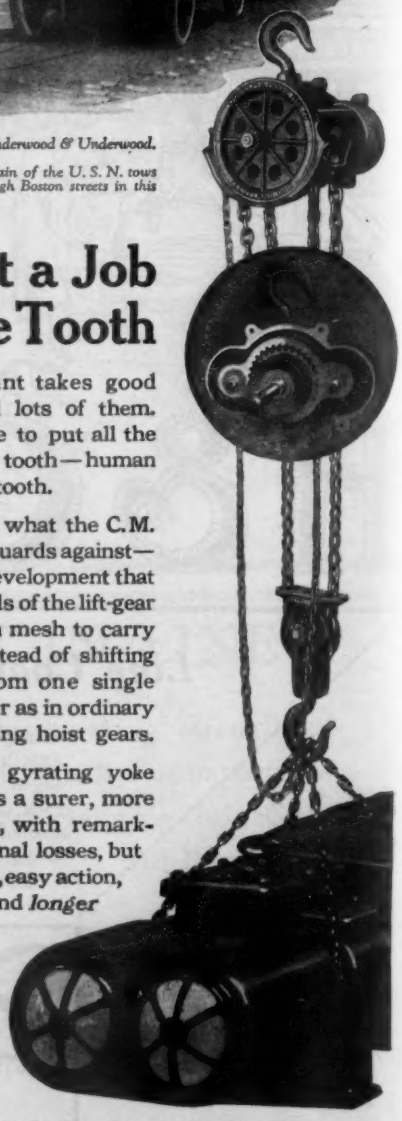
A Strong-jawed Boatswain of the U. S. N. tows three automobiles through Boston streets in this fashion.

It's Not a Job *for* One Tooth

SUCH a stunt takes good teeth—and lots of them. It's hardly safe to put all the strain on one tooth—human molar or gear tooth.

That's exactly what the C.M. gyrating yoke guards against—an exclusive development that keeps two-thirds of the lift-gear teeth always in mesh to carry the weight, instead of shifting the weight from one single tooth to another as in ordinary circular rotating hoist gears.

This patented gyrating yoke not only means a surer, more powerful drive, with remarkably low frictional losses, but insures smooth, easy action, higher speeds and *longer service!*



Catalog covering Hoists, Cranes and Trolleys sent on request.

The Chisholm-Moore Mfg. Co.
Cleveland, O.
NEW YORK CHICAGO PITTSBURGH

CYCLONE
HIGH SPEED
The hoist with the gyrating yoke **HOISTS**

BALL BEARINGS Chapman

YOU PAY FOR THEM WHETHER YOU BUY THEM OR NOT

Who Pays?

Who pays for the power that friction steals—right in your own plant?

You do! But that is because you have not become familiar with the famous CHAPMAN BALL BEARINGS.

Day after day, year in and year out, you keep on paying for power that you do not get—power that FRICTION consumes.

CHAPMAN-IZE NOW AND SAVE MONEY

Here is an investment that will save you money as long as you are a producer through the use of power—an investment that pays for itself in a couple of years. "CHAPMAN BALL BEARINGS ON ALL YOUR LINE-SHAFTING ELIMINATES FRICTION."

Fool-proof, trouble-proof, care-free are these enemies of friction—and they'll save you as much as 15% to 40% in power costs.

The saving is too great to ignore! You pay for CHAPMAN'S whether you buy them or not! Why not have them?
THEY FIT YOUR PRESENT HANGER FRAMES

Drop us a line, and we'll be glad to tell you more.

TRANSMISSION BALL BEARING COMPANY

1061 MILITARY ROAD BUFFALO, N. Y.

Branches: New York, Chicago, Philadelphia, Cambridge, Mass.; Toronto, Canada. Representatives in Principal Cities.

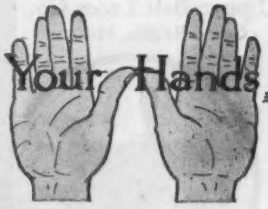
A few of thousands of plants NOW USING CHAPMANS As Standard Equipment

GILLETTE SAFETY RAZOR CO. Boston, Mass.
INTERNATIONAL MOTOR CO. Plainfield, N. J
PIERCE-ARROW MOTOR CAR CO. Buffalo, N. Y.
OSTERLEIN MACHINE CO. Cincinnati, Ohio
GOULD & EBERHARDT Newark, N. J.
BETHLEHEM STEEL CO. South Bethlehem, Pa.
FORD MOTOR CO. Walkerville, Ont.
FISHER BODY CO. Detroit, Mich.
WATERBURY MAN'F'G CO. Waterbury, Conn.
ROCK ISLAND ARSENAL Rock Island, Ill.
BAUSCH & LOMB OPTICAL CO. Rochester, N. Y.
CHICAGO PNEUMATIC TOOL CO. Franklin, Pa.
CRUCIBLE STEEL CO. Jersey City and Pittsburgh
HOOVER STEEL BALL CO. Ann Harbor, Mich.
AMERICAN EVER READY CO. Long Island City, N. Y.
NATIONAL TOOL CO. Cleveland, Ohio
SUPERIOR GAS ENGINE CO. Springfield, Ohio
VICTORIA COTTON MILLS Rock Hill, S. C.

A Hammer

A Piece of Soft Wood

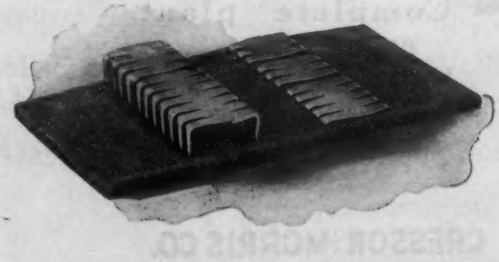
Your Hands



LACE YOUR OWN BELTS

Don't be tied to an experienced belt lacer.
Your own men can repair your belts with

Bristol's Patent Steel Belt Lacing



Belts fastened with it have great strength in the joint, and the application can be easily and quickly made by hand. Nothing can approach Bristol's Lacing for economy.

Ask for copy of Bulletin 713-J.

THE BRISTOL COMPANY : WATERBURY, CONN.

Boston New York Philadelphia Pittsburgh Detroit
Chicago St. Louis San Francisco

A Smooth, Strong, Flexible, Lasting Joint

SAVES TIME— SAVES BELTS

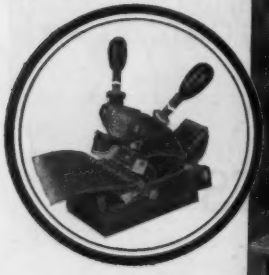
To have just one belt laced by old fashioned methods costs you the time of the millwright, of the idle machine operators waiting for him to finish his job, loss of production, the depreciation of a costly belt weakened by punching, constant loss of power due to uneven joint and early repetition of the work owing to weakening of belt.

With a Clipper Belt Lacer the cost is three minutes time, plus the necessary Clipper hooks. These hooks produce a joint more flexible than the belt itself and will not injure your belting.

Sold by Mill Supply Dealers in All Principal Cities

Mark the Coupon and Mail With Your Letterhead

Clipper Belt Lacer Co.
Grand Rapids, Mich.



Anyone can lace a belt with the

Clipper

COUPON

- ☐ Please send Clipper Belt Lacer on 30 days trial.
- ☐ Please have salesman call and demonstrate Clipper Belt Lacer.
- ☐ Please send full information regarding Clipper Belt Lacer.

Name_____

Address_____

Strong Durable Economical

THE BELT FOR MANY TEXTILE DRIVES

IT has stronger pull than the best oak tanned belting, because it is built from Rhoads Tannate side leather, and has the wonderful Tannate grip.

It will run over small pulleys at high speed because of its Tannate pliability.

And, like Tannate, it resists machine oils, acid fumes, and high temperatures.

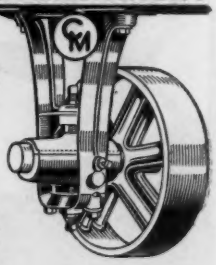
STRONGHOLD LIGHT DOUBLES are an unusual value on drives where you are accustomed to use regular oak doubles. They give more R.P.M. which means greater output.

J. E. RHOADS & SONS

PHILADELPHIA, 30 N. THIRD ST.
NEW YORK, 130 BEEKMAN ST.
CHICAGO, 330 W. RANDOLPH ST.
FACTORY AND TANNERY, WILMINGTON, DEL.

CRESSON-MORRIS

POWER TRANSMITTING MACHINERY



Power transmitting machinery
Shafting
Rope transmission
Machine moulded and cut iron and steel gears for heavy service.
Complete plant equipment.
Engineers; founders; machinists.
Sugar centrifugals.

CRESSON-MORRIS CO.

PHILADELPHIA, PENNSYLVANIA

Branch Office:
608 Little Bldg., 80 Boylston St., Boston, Mass.

2159-X

Sixty Years Experience as Engineers·Founders·Machinists

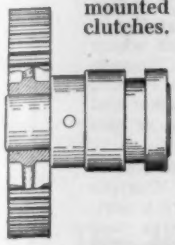
THE JOHNSON FRICTION CLUTCH

AS USED ON

THE WERNER

TWO-ROLL HEAVY SQUEEZER FOR PIECE GOODS

Spur Gears, sprockets or pulleys are easily mounted with our clutches.



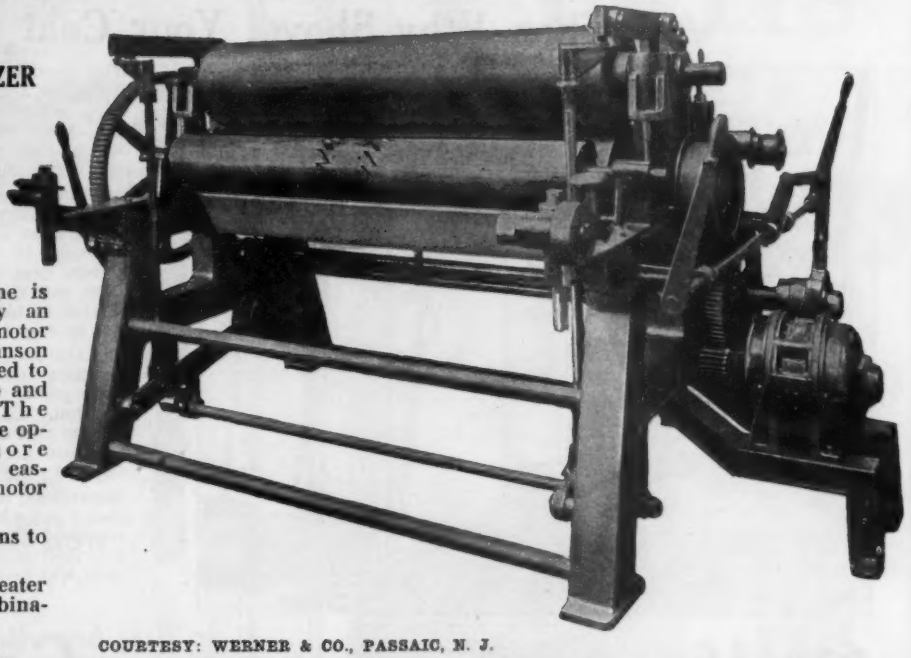
SINGLE CLUTCH WITH SPUR GEAR

This machine is operated by an individual motor and the Johnson Clutch is used to quickly stop and start it. The clutch can be operated more quickly and easily than a motor can be stopped or started.

The Johnson Clutch is a means to better machinery.

Better machinery means greater production. A saving combination.

WRITE FOR CATALOG "C."



COURTESY: WERNER & CO., PASSAIC, N. J.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

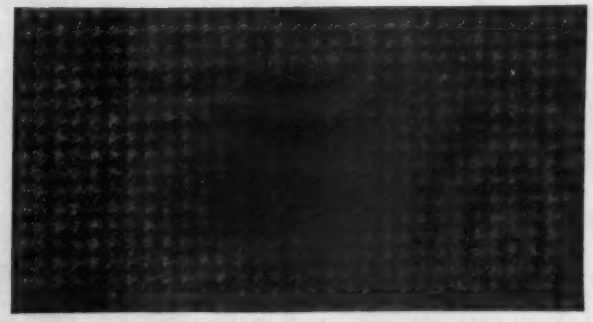
Stained Goods!

Hot Bearings mean short life.

Bearings are expensive.

Oil running out of bearings means dirty floors and machinery. RESULTS! WASTED MATERIAL FROM STAINED GOODS.

STAYSWELL laughs at drips and spatters.



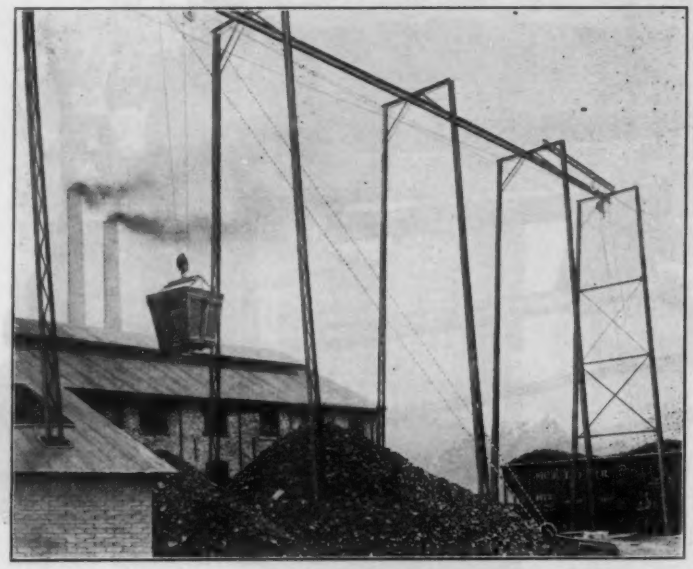
STAINED GOODS ARE EASY TO AVOID BY USING THE SNOW-WHITE STAINLESS GRADES OF *STAYSWELL*

STAYSWELL "STAYS PUT" on the hottest bearing, eliminating all friction.

Let us quote you on your requirements.

LAMSON OIL CO., Inc.
10 Dorrance St. Wharf
PROVIDENCE, R. I.

You Don't Pump Your Water By Hand
Then Why Shovel Your Coal



Why depend on costly hand shoveling when a simple, clean cut, effilient—low priced—conveyor, like the one shown here will unload your coal in only a fraction of the time and for much less money?

Only one man is required to operate this equipment. He is stationed at the hoist alongside the pit where the coal is received from hopper-bottom cars through a steel track chute into the conveying bucket and carried to bins, boiler room or outside storage.

The average power and labor cost of handling coal with the *Godfrey Conveyor* is from five to seven cents per ton. Compare this with your present cost and you will understand how one firm saved $120.00 in one day with our equipment.

Regardless of what your requirements may be, there is a type of *Godfrey Conveyor* to serve you. Descriptive literature and full details will be mailed upon request.

Ask for Catalog Z.

Godfrey Conveyor Company

Philadelphia, 726 Drexel Bldg. **Elkhart, Indiana, U. S. A.** Pittsburgh, 601 Columbia Bank Bldg.

BETTER **NON-FLUID OIL** LUBRICATION

Counterfeit Money May Look Good—
but it isn't made of the right stuff.

Imperfect lubrication of substitute lubricants causes you trouble and costs the mill more money.

Insist on genuine

TRADE MARK REGISTERED IN
NON-FLUID OIL
UNITED STATES PATENT OFFICE

Modern Textile Lubricants

NON-FLUID OIL stays in bearings giving perfect and positive lubrication—lasts longer per application—and costs less per month, at the same time avoiding oil stains because of its adhesiveness.

Try it for yourself, testing sample free on request.

NEW YORK & NEW JERSEY LUBRICANT CO.
401 Broadway New York
Southern Agent, L. W. Thomason, Charlotte, N. C.
Ample Stocks at our Branches:
Charlotte, N. C.; Greenville, S. C.; Atlanta, Ga.; New Orleans, La.

AT LESS COST PER MONTH

Standard Oxygen

The Dominant Factor

The dominant factor today is economy. Thru economy, greater profits are possible—and a small leak in your profits now should not go unheeded. When a machine breaks down—what do you do? Buy another? If so, you are losing money that can be saved.

With STANDARD Welding Apparatus and Supplies you can weld broken machinery or build up worn machinery and parts at less than ⅓ their original cost. Does this mean anything to you? STANDARD Oxygen is recognized as the best that money can buy. It is 99.5% pure.

Have you our data? Write us.

STANDARD
GAS PRODUCTS CO., INC.
ATLANTA

TRADE JENKINS MARK
Jenkins Bros.

Fig. 720 Jenkins Brass Rapid Action Valve

This Rapid Action Valve gives instantaneous full flow

Full opening with one pull of lever. Stays open automatically. Closed by slight pull of lever, without shock or water-hammer. Stops water waste—saves time. For wash wheels in laundries, shower baths, dye works, hat factories, and any use where a dependable, quick opening valve is required.

Send for descriptive folder.

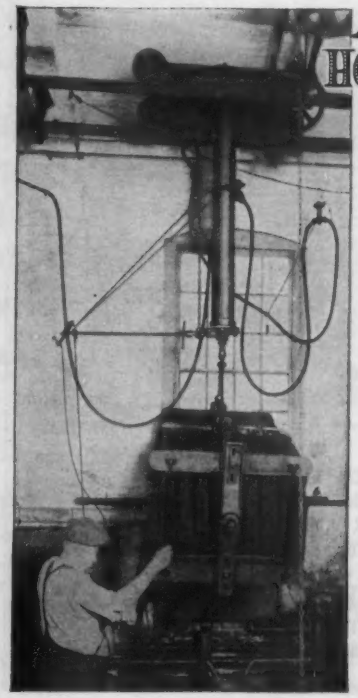
JENKINS BROS.

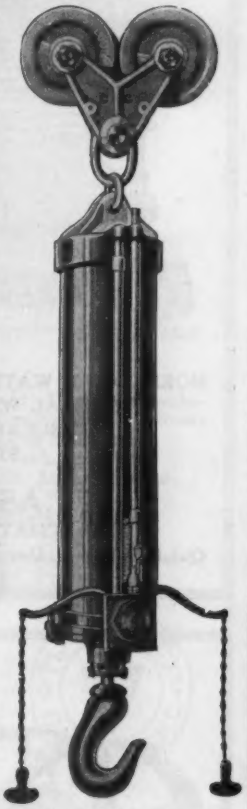
80 White St., New York, N. Y.

Jenkins Valves

SINCE 1864

CURTIS AIR HOISTS





"Lift it with air"

Used in The Textile Industry

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

Curtis Pneumatic Machinery Co.

1571 Kienlin Ave., St. Louis, Mo.

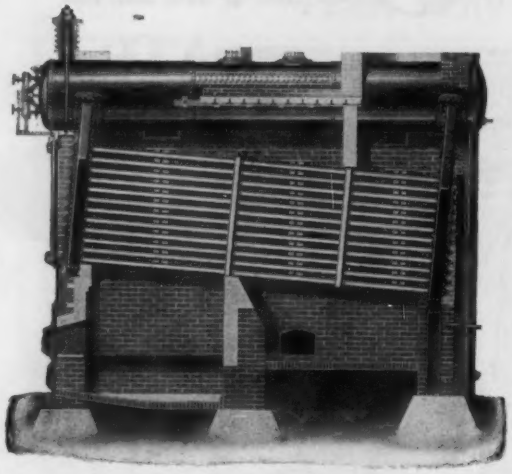
Branch Office

532-R Hudson Terminal New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
C.P.M.Co

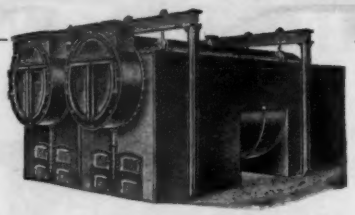
Established 1854

WATER TUBE BOILERS



HORIZONTAL WATER TUBE BOILERS
VERTICAL WATER TUBE BOILERS
TUBULAR AND MARINE BOILERS
STEEL CASINGS, SMOKE STACKS

THE CASEY-HEDGES CO.
CHATTANOOGA, TENN.
Quick Shipment Our Specialty. Send for Catalogs.



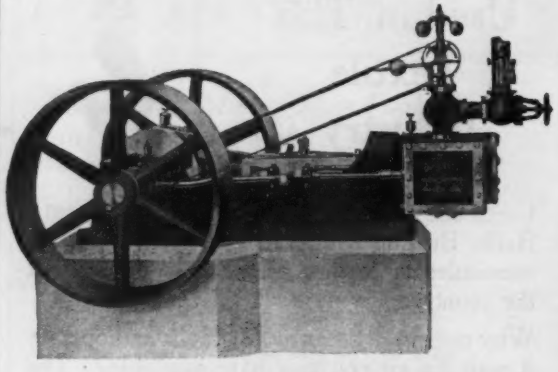
The Result of a Quarter Century Experience

These years of experience and study together with exhaustive tests and improvements, has enabled us to build modern boilers that are second to none—in design, construction, high efficiency and capacity, economical operation, and low cost for upkeep.

Made in several types. Write us today and let us send you full data and reasons why the W & W BOILER will best meet your reqvirements.

The Walsh & Weidner Boiler Co.
CHATTANOOGA, TENN.

WALSH & WEIDNER
TUBULAR WATER TUBE **BOILERS**



J. S. Schofield's Sons Co.
Macon, Georgia
MANUFACTURERS OF
High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.
Heavy Castings and Wrought Iron Works.

Atlanta, Birmingham & Atlantic Railway

Traverses the most rapidly developing sections of Georgia and Alabama, where excellent opportunities are offered for commercial development, and where supplies of coal, coke, timber and other raw materials are available in abundance.

IF YOU WANT A FACTORY SITE WE CAN HELP YOU FIND WHAT YOU WANT.
For further information communicate with

H. S. YOUNG, Industrial Agent
ATLANTA, GA.

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.

The Recognized Standards of Quality

COTTON YARNS

Gray Manufacturing Co.
Arrow Mills, Inc.
Parkdale Mills, Inc.
Flint Manufacturing Co.
Arkray Mills, Inc.
Arlington Cotton Mills
Myrtle Mills, Inc.

Our Fine Yarns Make Fine Fabrics

The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

30s to 80s Single and Ply Combed Peeler Right Twist. 30's to 50's Single and Ply Double Carded Peeler, Right or Reverse Twist.

20s to 60s, 2, 3, and 4 Ply, Combed Peeler, Reverse Twist.

Our products are sold direct and exclusively through our General Sales Offices:
225 Fifth Avenue at 26th Street, New York.
H. A. FLORSHEIM, Sales Manager
Long Distance Phone:
Madison Sq. 7666-7-8 and 9.
BRANCH OFFICES { Boston, Philadelphia, Chicago

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF
Cotton Mercerized Tapes. Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

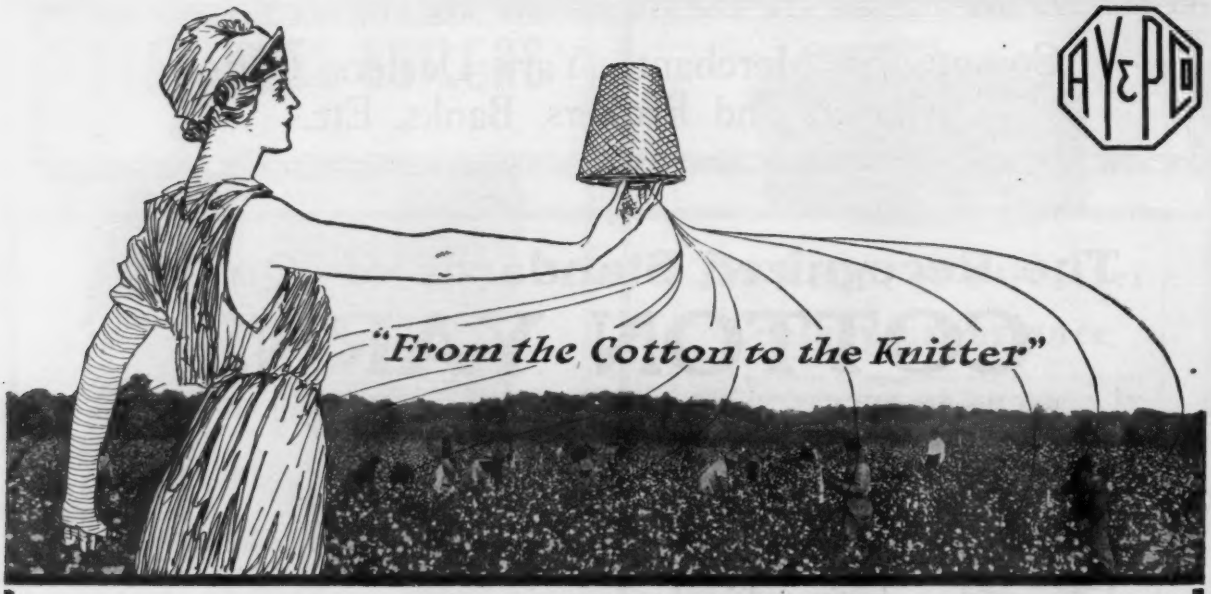
43-45 WORTH STREET, NEW YORK

CARVER-BEAVER YARN CO.

Successors to A. D. SALKELD & BRO., Inc.
ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED
366 BROADWAY, NEW YORK

STENCILS

FOR COTTON SHIPPERS, COTTON MILLS, MERCHANTS & MANUFACTURERS - ALSO BRUSHES, INK, MARKING POTS
RUBBER STAMPS NOTARIAL CORPORATION SEALS
ATLANTA RUBBER STAMP & STENCIL WORKS
OFFICE 33 LUCKIE ST. WORKS: 350 EDGEWOOD AVE.
P.O. BOX 854. LARGEST STENCIL AND STAMP HOUSE IN GEORGIA ATLANTA, GA.



AY&PCo

AMERICAN YARN & PROCESSING CO.

MOUNT HOLLY, N. C.

SPINNERS AND MERCERIZERS

HIGH GRADE COMBED AND CARDED YARNS—16s to 80s

Our Mercerized Yarns Are the Product of Our Own Mills

General Office, Mt. Holly, N. C. **Branch Office, 1111 James Bldg., Chattanooga, Tenn.**

Representatives

H. B. ROBIE, 346 Broadway, New York City **FORREST BROS., Forrest Bldg., Philadelphia**

—SILK—
Oscar Heineman Co.
CHICAGO

SINGLE MERCERIZED
—YARNS—
Southern Mercerizing Co.

SOUTHERN YARN CO.

911 JAMES BUILDING, CHATTANOOGA, TENN.

—SINGLES AND PLY YARNS
OF EVERY DESCRIPTION
DIRECT FROM SPINNERS—

HUGHES FAWCETT

IMPORTER AND COMMISSION MERCHANT

LINEN YARNS

For Weaving, Knitting and all Purposes.

TURKEY RED YARNS

For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine

And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK

LOGICAL LOCATION

FOR

TEXTILE INDUSTRIES

Georgia has 201 textile plants, of which 115 or 57% are in cities served by the Central of Georgia.

Alabama has 74 textile plants, of which 27 or 36% are in cities served by the Central of Georgia.

The fact that these are successful, going concerns is convincing evidence that they are properly located.

This territory being supplied with hydro-electric power in ample quantity, and with nearby coal fields of Alabama and Tennessee, the question of power is fully solved.

While other essential requirements, such as labor, climate, adequate transportation and nearness to raw materials all combine to enable the Central of Georgia territory to offer those establishing new mills a location that is ideal and of proven value.

Further and detailed information will be gladly furnished upon request.

J. M. MALLORY, General Industrial Agent

Central of Georgia Railway

SAVANNAH, GEORGIA

Callaway Mills

INCORPORATED

345 Madison Avenue

Phone—Murray Hill 7801

NEW YORK

SELLING AGENTS
Unity Cotton Mills
Milstead Manufacturing Co.
Elm City Cotton Mills
Manchester Cotton Mills
Hillside Cotton Mills
Unity Spinning Mills
Villa Rica Cotton Mills
Athens Manufacturing Co.

Boston Representative
M. R. ABBOTT
110 Summer Street

Chicago Representative
RAY T. JOHNSON
226 W. Adams Street

ESTABLISHED 1872

H. & B. BEER

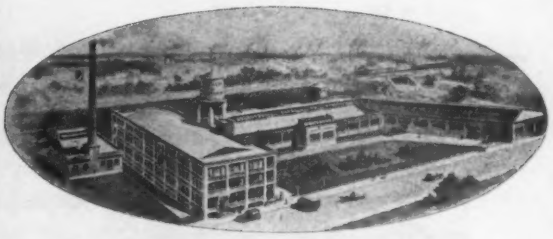
NEW ORLEANS

HENRY BEER · EDGAR H. BRIGHT
J. WILLIAM BARKDULL · C. MORGAN ABRAMS

MEMBERS OF
New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points



View of our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

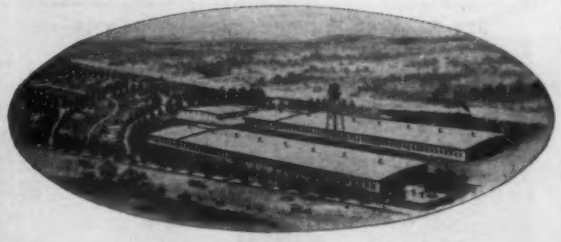
Established 1908

Spinners, Bleachers, Dyers and Mercerizers of High Grade Combed Yarns

By using our Spinning and Mercerizing you are always assured of a standard product.

"From the Cotton Field Direct to You"

Main Office, Factory and Warehouse
J and East Venango Sts., PHILADELPHIA



Spinning Mills, Lincolnton, N. C.

UPTOWN CHICAGO'S
MOST FAVORED HOTEL
500 ROOMS, EACH WITH PRIVATE BATH

Hotel Sheridan-Plaza

CHICAGO
Sheridan Road at Wilson Avenue

Thousands who know the Chicago of today now prefer the large hotels of the North Shore. The beautiful new Sheridan Plaza is not only "Uptown Chicago's most favored hotel," but one of America's finest. Whether you come on business or for recreation, the Sheridan Plaza will please you. Music and dancing every evening. Moderate costs. Excellent Restaurant; Narcissus Grill cafeteria. Eighteen minutes from down-town; elevated express and surface lines; motor busses to and from downtown, through Lincoln Park, stop at the door. Exceptional garage accommodations.

European plan. Rooms, with private bath, $3.00 a day and up. Reservations are advisable.

ATLANTA'S NEW MILLION DOLLAR HOTEL
POPULAR PRICED

HOTEL CECIL

COFFEE SHOP—ROOF GARDEN

312 ROOMS—FIRE PROOF—312 BATHS
RATES PER DAY, EUROPEAN PLAN

	ONE PERSON	TWO PERSONS
22 ROOMS AND BATH	$1.50	
104 ROOMS AND BATH	2.00	$3.00
104 ROOMS AND BATH	2.50	4.00
53 ROOMS AND BATH	3.00	5.00
14 ROOMS AND BATH	4.00	6.00
8 ROOMS AND BATH TWIN BEDS		5.00
7 ROOMS AND BATH TWIN BEDS		7.00

H. R. and C. R. CANNON, Proprietors
J. F. deJARNETTE, Manager
OPERATING
GEORGIAN HOTEL, ATHENS, GA. TERMINAL HOTEL, ATLANTA, GA.

EUROPEAN PLAN
Rooms 600 Baths
Headquarters in Detroit for

OLD COLONY CLUB
DETROIT AUTOMOBILE CLUB

. . DAILY RATES . .

100 at $2.50	Single—	$4.50	Double
150 " $3.00	"	—$5.00	"
100 " $4.00	"	—$6.00	"
50 " $5.00	"	—$7.00	"

50 with Twin Beds, $5.00 to $7.00
100 In Suite, $5.00 to $8.00, Double
Two Floors of Agents' Sample Rooms $5.00 per Day
Table d'Hote Dinner, $1.25-$2.00

HOTEL TULLER

Under New Management
O. C. FROMAN, Mgr.
CAFETERIA GRILLE
Business Men's Lunch 65c.

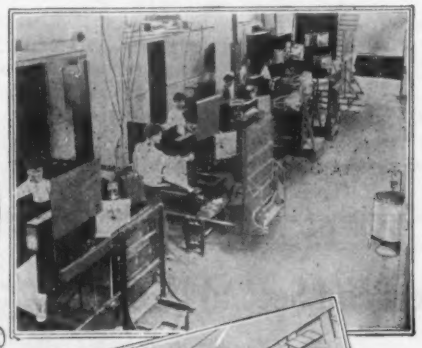
If It's A Broadside—

If it is an especially large illustration for an especially large piece of literature, chart, birds eye view, map, etc. Whether it be in one or more colors, our plant is equipped to supply your needs. No halftone or line plate too large or too small for our equipment.

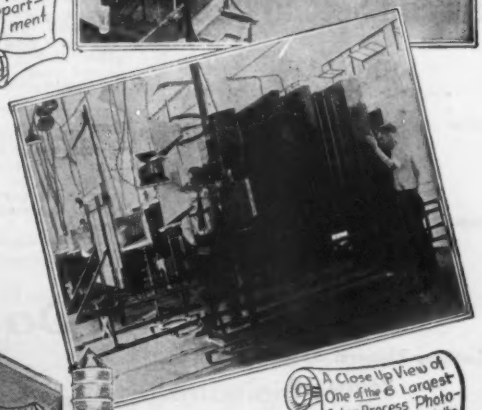
Illustrating Your Literature

Sometimes in the preparation of your sales and advertising plans you find the need of some especially prepared piece of literature, the execution of which will baffle your photographer, electrotyper and printer. Frequently you may seek a service that the ordinary plant cannot give.

Our plant is designed and equipped for the accomplishment of many difficult products that cannot be secured from most photo-engraving establishments; is equipped to furnish the best of photo-engraving, electrotyping, printing, nickeltyping, commercial art and allied service, whether large or small, whether one or more colors. The extent of our equipment is reflected in the large process camera, which can furnish you with process color plates as large as a yard square. One of the 6 largest in the world. If you have an idea you wish carried into execution, we are at your service. We will gladly perfect it and illustrate it.



Battery of Cameras in the Photo-Engraving Department



A Close Up View of One of the 6 Largest Color Process Photo-engraving Cameras in the World-Installed in the Photo-engraving Dept. of Jacobs & Co.

Jacobs & Company

Clinton, S. C.

Advertising, Commercial Art
Photo-Engraving—Electrotyping
Nickeltyping
Color Printing

General Offices Advertising and Multigraphing
Electrotyping Nickeltyping
Photo Engraving Commercial Art Photography
Fine Arts Printing and Binding

CLASSIFIED ADVERTISING

RATES:

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(*When replies are to be received in our care, allow four words for box address.*)

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

LOW GRADE EGYPTIAN COTTON

BETTER AND CHEAPER THAN CARD STRIPPS.
WIRE US FOR TYPES AND QUOTATIONS.

A. A. MacWHINNIE & CO., 70 KILBY STREET, BOSTON, MASS.

PROPOSALS FOR INDIAN SUPPLIES.—Department of the Interior, Office of Indian Affairs, Washington, D. C., Feb. 7, 1923. SEALED PROPOSALS, plainly marked on the outside of the sealed envelope: "Proposal for groceries" (or other class of supplies, as the case may be) and addressed to the "Commissioner of Indian Affairs, U. S. Indian Warehouse, 1749 West Pershing Road, Chicago, Ill.," will be received until 10 o'clock a. m. on each of the following dates and on the class of supplies specified, and then opened: Dry goods, Apr. 4, 1923; Underwear, hosiery, gloves, suspenders, hats and caps, Apr. 7, 1923; Notions, Apr. 4, 1923; Groceries, Mar. 26, 1923; Agricultural implements, wagons, etc., Apr. 2, 1923; Schoolbooks, etc., Mar. 31, 1923; Chinaware, etc., Mar. 28, 1923; Automobile supplies, Mar. 28, 1923. Similar proposals on Clothing and piece goods, addressed to the "Commissioner of Indian Affairs, Washington, D. C.," will be received until 10 o'clock a. m. on Mar. 15, 1923, and then opened. Schedules covering all necessary information for bidders will be furnished upon application to the Indian Office, Washington, D. C., or the U. S. Indian Warehouses at Chicago, St. Louis, and San Francisco. The Department reserves the right to reject any or all bids or any part of any bid, and to post tentative awards promptly, subject to correction. CHAS. H. BURKE, Commissioner.

WANTED—Position as Boss Carder. Medium or fine work preferred. Am a college man with two years' training under capable men—can give best of references as to character, ability, etc. At present employed as second hand. Address Box 76 care COTTON, Atlanta, Ga.

POSITION WANTED—Supt. of Small Mill or Asst. Supt. in large mill. 30 years of age. 8 years practical experience in New England—Overseer of Carding and Spinning—One year in Jacquard Weaving—Excellent References. Address F. S., care COTTON, Atlanta, Ga.

For Sale

BED SPREAD PLANT.

A complete plant in full operation, consisting of 24 C. & K. 96-inch 4 x 4 box Looms with sewing, fringing, beaming, cop and bobbin winding machinery, in full operation. Owner retiring. Address

BOX 74, Care COTTON,
Atlanta, Ga.

HIGH GRADE dependable salesmen, with wide and successful experience with Department Stores, Jobbers, and Mail Order Houses, Chicago territory, desires to represent Manufacturer of line of merit. Manufacturer to carry accounts, commission basis, drawing account not a requisite. Pay own expenses. Address Box 62, care COTTON, Atlanta, Ga.

Do You Want to Sell It?

Probably you, like many other mills, have some equipment which you have taken out, or are thinking of taking out and replacing with new equipment.

Why not dispose of this second-hand equipment at a profit? COTTON is read by thousands of Cotton Mills that are hardly touched by Northern journals.

You Can Sell Your Second-Hand Equipment

to these mills through advertising in the Classified Advertising Section of COTTON. Such advertising produces results at small cost—why not try it out and get that second-hand equipment off your hands in a profitable way? Tell us what you have for sale and let us insert an advertisement for you.

COTTON

GRANT BUILDING ATLANTA, GA.

Textile Mill Equipment

All At Bargain Prices

Cotton Dryers

25—Sargent No. 24 six section 8 foot Cotton Dryers. Overall dimensions 99′4″ long, 15′5″ wide, 7′10″ high. Equipped with Model "M" Self feeder. Hot air drawn through belt by 33″ exhaust fans. Constructed throughout of metal angles and plates.

Mixing Pickers

25—Sargent Cylindrical type 48″ Mixing Pickers. Equipped with single pair fluted feed rolls, 3½″ diameter. Cylinder provided with 6 heavy steel bars on lugs bolted to spider. Capacity 600 to 800 lbs. per hour.

Cotton Washers

25—Sargent 48″ Special Cotton Washers or Rinsers. Complete with cast iron frame, pans, squeeze rolls, kicker and conveyor.

Feeders

25—Sargent 48″ Model "M" Feeders for Sargent Dryers.

Concentrators

8—Noble and Wood Concentrators right and left hand cylinder washers with octagon cylinder diameter 44″, length 42″. Rotates at 6 R.P.M. Vat is 1′4½″ wide, 6′9″ long, 2′9″ high.

Wringers

65—42″ American Tool and Machine Co. Centrifugal Wringers. Complete with 42″ perforated steel basket shell, with steel top, basket 22½″ inside depth, ⅜″ steel Wringer direct connected to 40 H.P. Motor.

18—Sets 36″ American Tool and Machine Co. Belt Driven Centrifugal Wringers. Each set arranged in batteries of three.

Digesters

40—Welded Steel Digesters. Capacity 1300 cu. ft. Inside diameter 8′, length overall 27′. Complete with cast iron supporting ring, false bottom, hoppers, guides and all accessories.

823 H.P. Boilers

36—823-H.P. Stirling Boilers. Class M-30, complete with all accessories. Babcock & Wilcox Co., New York, makers. 200 lbs. pressure, 630 3½-in. tubes, No. 10 gauge, 150 of these tubes are circulators. Steam drums, double riveted, double strap butt joint, 1-in. rivets. Thickness shell plate and tube ends in steam drums ⅞ in. mud drum 1 in. Space occupied by boiler 18 ft. by 22 ft. 3 in. by 29 ft. 9 in. high. Complete with all accessories.

350 H.P. Engines

18—Corliss Engines. Maker Allis-Chalmers Co. 350 H.P. 18 in. x 36 in. double eccentric, semi-high speed, 125 R.P.M., simple Corliss belted type, designed to operate on 140 lbs. steam pressure with 1½ lbs. back pressure. Double eccentric allows cut off up to 75 per cent of stroke. Flywheel 11 ft. diameter by 32-in. face. Complete with Phoenix individual oiling system. Type R, size 30, made by Richardson-Phoenix Co.

Motors

225—Slightly used Motors 7½-75 H.P. 3 Phase 60 Cycle, 440 Volt.

Tanks

1000—Steel Tanks, 100-55,000 gallon capacity.

350—Wood Tanks, New and Used

Size	Capacity
12′6″ x 11′	10150 gal.
12′6″ x 18′	16600 gal.

Send for Bulletin No. 7.

Scales

500—Howe and Fairbanks Scales. Capacities 600 lbs. to 100 tons. Guaranteed to be in good condition.

Transmission

Pulleys	Shafting
Pillow Blocks	Drop Hangers
Bearings	Couplings
Floor Brackets	Floor Stands
Friction Clutches	Collars

Write for Bulletin No. 15.

Let us submit our quotations and save you money

NASHVILLE INDUSTRIAL CORPORATION

JACKSONVILLE, TENNESSEE

Buyers' Index

ACETYLENE GAS.
Commercial Acetylene Supply Co.
Oxyeld Acetylene Co.
Standard Gas Products Co.

ACETYLENE WELDING APPARATUS.
(See Welding Apparatus.)

ACIDS.
(See Dyestuff and Chemicals.)

ACCOUNTANTS.
Ernst & Ernst.
La Frents & Co., F. W.

ACCOUNTING SYSTEMS.
Ernst & Ernst.

ADDING MACHINES.
Monroe Calc. Mch. Co.

AERATING AND CLEANING MACHINE.
Murray Company, The.

AIR WASHERS.
American Blower Co.
Buckeye Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.
Sturtevant Co., B. F.

AIR COMPRESSORS.
(See Compressors.)

AIR CONDITIONING SYSTEMS
(See Humidifying Apparatus.)

ALBONE.
Roessler & Hasslacher Chemical Co.

ALKALIES.
(See Dyestuffs and Chemicals.)

ALUM.
(See Finishing and Sizing Materials.)

ANILINE COLORS.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE ACID GENERATOR.
Macomb Machine Co.

APRONS—RUB.
Bond Co., Chas.
Smith & Furbush Machine Co.

ARCHITECTS AND ENGINEERS.
Lockwood, Greene & Co.
Robert & Co.
Sirrine, J. E.
Stuhrman, Edw. A.

ARTWORK.
Jacobs & Co.

ASH HANDLING MACHINERY.
(See Coal Handling Machinery.)

ASPHALT SLATE SHINGLES.
(See Slate Asphalt Roofing.)

ASPIRATORS.
Belger Co.

AUDITORS AND ACCOUNTANTS.
Ernst & Ernst.
La Frents & Co., F. W.

AUTO TRUCKS.
(See Trucks—Auto.)

AUTOMATIC CONTROLLERS (TEMPERATURE).
(See Temperature Regulators.)

AUTOMATIC LOOM ATTACHMENTS.
(See Loom Attachments.)

AUTOMATIC FEEDS FOR COTTON.
Brooks & Doxey, Ltd.
Lord Bros.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Whitin Mch. Works.

AUTOMATIC SCALES.
(See Scales.)

AUTOMOBILES.
White Co.

BACKWASHERS.
Sargent's Sons Corp., C. G.

BAROMETERS.
Taylor Instrument Co.

BALL BEARINGS.
Aldrich Mch. Works.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BALL BEARING HOUSINGS.
Aldrich Machine Works.
Fafnir Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BALE BAND BUCKLES.
(See Box Strapping & Buckles.)

BALE OPENERS.
(See Openers.)

BALING MACHINES.
Brooks & Doxey, Ltd.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Logemann Bros.
Lord Bros.
Rex Eng'g Corp.
Saco-Lowell Shops.

BALING PRESSES.
(See Presses.)

BANDAGES, TAPES, ETC.
American Textile Banding Co.
Weimar Bros.

BANDAGE & TAPE MACHINES.
Foster Machine Co.
Whitin Mch. Wks.

BANDS.
(See Tapes.)

BANDS (HOSIERY LABELS AND STICKERS).
Kirby-Cogeshall Co.

BANKS.
National Shawmut Bank.

BARRELS—FIBRE.
(See Fibre Products.)

BASKETS—MILL.
(See Boxes—Mill.)

BATH CABINET—SHOWER.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

BATTERIES (ELEC.)
(See Storage Batteries.)

BEAMS.
Allen Co.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAM DYEING MACHINES.
Brandwood, John.
Cocker Mch. & Fdry. Co.

BEAM HEADS.
Allen Co.
Jordan Mfg. Co.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAMING AND WARPING MACHINERY.
(See Warpers and Warping Machinery.)

BEARINGS.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Renold, Inc., Hans.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Wood's Sons Co., T. B.

BELTING (LEATHER, CANVAS AND RUBBER).
American Supply Co.
Bond Co., Chas.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELTING—CHAIN.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.

BELTING (ROUND—LEATHER).
Bond Co., Chas.
Rhoads & Sons, J. E.

BELTING—ROPE.
(See Rope Transmission.)

BELT CONVEYORS.
Dodge Sales & Eng. Co.
Link-Belt Company.
Morse Chain Co.

BELT DRESSING.
Bond Co., Chas.
Dixon Crucible Co., Jos.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT FASTENERS AND LACING.
Bond Co., Chas.
Bristol Co.
Clipper Belt Lacer Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT TIGHTENERS.
Link-Belt Company.
Rhoads & Sons, J. E.
Wood's Sons Co., T. B.

BENCH DRAWERS.
Lupton's Sons Co., David.

BENCH LEGS (PRESSED STEEL).
Lupton's Sons Co., David.

BENCHES (PARK AND PLAYGROUND).
(See Playground Equipment.)

BLEACHERIES.
(See Dyers, Bleachers and Finishers.)

BLEACHING KIERS.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.
Woolford Wood Tank Co., G.

BLEACHING MACHINERY.
(See Dyeing, Bleaching and Finishing Machinery.)

BLEACHING, FINISHING AND SIZING MATERIALS.
(See Finishing Materials.)

BLOWERS AND BLOWER SYSTEMS.
American Blower Co.
Buckeye Blower Co.
Carrier Eng. Corp.
General Electric Co.
Philadelphia Drying Mchry. Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

BOARDS—FIBRE.
National Vulcanized Fibre Co.
Standard Fibre Co.

BOARDS—FORM.
Pearson, Jos. T.

BOBBINS.
Draper Corporation.
Jordan Mfg. Co.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
Shambow Shuttle Co.
Vermont Spool & Bobbin Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

BOBBIN HEADS.
Allen Co.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

BOBBIN STRIPPERS.
Crompton & Knowles Loom Works.

BOILERS.
Casey-Hedges Co.
Cole Mfg. Co., R. D.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

BOILER COMPOUNDS.
Dixon Crucible Co., Jos.

BOILER FEED WATER PURIFICATION.
American Water Softener Co.
Casey-Hedges Co.
Norwood Engineering Co.
Scaife & Sons, Wm. B.

BOILER ROOM FITTINGS AND SUPPLIES.
American Blower Co.
Bristol Co.
Casey-Hedges Co.
Crane Co.
Dixon Crucible Co., Jos.
Godfrey Conveyor Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.
Sturtevant Co., B. F.

BOILER GRATES AND STOKERS.
(See Grates and Stokers.)

BOOKKEEPING MACHINES.
Monroe Calc. Mch. Co.

BOX STRAPPING AND TIE BUCKLES.
(See Banding Straps and Buckles.)

BOXES—MILL.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
National Vulcanized Fibre Co.
Standard Fibre Co.

BOXES—PACKING.
(See Packing Boxes.)

BRAID.
(See Tapes.)

BRAZING.
(See Welding.)

BRICK (PAVING AND FLOOR)
National Paving Brick Co.

BROKERS—COTTON.
(See Cotton Dealers & Brokers.)

BROKERS—STOCK.
(See Stocks and Bonds.)

BROOMS.
(See Brushes.)

BROOMS—REFILLABLE.
Re-Fil-It Broom Mfg. Co.

BRUSHES—MILL.
Atlanta Brush Co.
Re-Fil-It Broom Mfg. Co.
Southwestern Broom Mfg. Co.

BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

BUCKETS AND PAILS—MILL.
Standard Fibre Co.

BUCKETS—ELEVATOR AND GRAB.
Link-Belt Company.

BUCKLES—COTTON TIE.
(See Box Strapping and Ties.)

BUILDING CONTRACTORS.
(See Contractors.)

BUILDINGS (ALL STEEL).
Truscon Steel Co.

BUILDING MATERIAL.
Anchor Post Iron Works.
Barrett Co., The
Birmingham Slag Co.
Dixie Portland Cement Co.
Dufur & Co.
Hough Shade Corp.
Knapp Fence Co.
Lupton's Sons Co., David.
National Paving Brick Co.
St. Louis Surfacer & Paint Co.
Sanymetal Products Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.
Truscon Steel Co.
Walker Electric & Plb. Co.
Ware Paint Co.

BURR PICKERS.
Proctor & Schwartz, Inc.
Sargent's Sons, C. G.

BUSHINGS.
Dodge Sales & Eng. Co.
Southern Spindle & Flyer Co.

BUSINESS METHODS.
(See Consultants.)

CABINETS.
(See Lockers.)

CALCULATING MACHINES.
Monroe Calculating Mch. Co.

CALENDERS.
Butterworth & Sons Co., H. W.
Monaghan, Jas. F.
Textile Finishing Mchry. Co.

CALENDER ROLLS.
(See Rolls—Calender.)

CALLING SYSTEM—INTERTELEPHONE.
Carter Electric Co.

CAMLESS DETACHING DEVICES.
Belger Co.

CANS—ROVING.
National Vulcanized Fibre Co.
Standard Fibre Co.

CANS (DRYING).
(See Drying Equipment.)

CARS AND TRUCKS—FIBRE.
(See Trucks.)

CARBONIZING MACHINERY.
Klauder-Weldon Dyeing Machine Co.
Macomb Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry. Co.
Tolhurst Mch. Works.

CARDING MACHINERY AND SUPPLIES.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Manufacturers Machine Co.
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD CLOTHING.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Manufacturers Machine Co.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD FEEDS.
Brooks & Doxey, Ltd.
Lord Bros.
Proctor & Schwartz, Inc.
Schofield Co., Wm.
Whitin Machine Co.

CARD GRINDING MACHINERY
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Smith & Furbush Mach. Co.
Whitin Machine Works.

CARPET MACHINERY.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Schofield, Wm., Co.
Textile Finishing Mchry. Co.

CARRIER APRONS.
(See Aprons.)

CARRIER SYSTEM.
Curtis Pneumatic Machry. Co.

CASES—WOODEN.
(See Boxes.)

CASTINGS.
Briggs, Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

CAUSTIC SODA.
(See Bleaching Materials.)

CEMENT.
Dixie Portland Cement Co.

CEMENT REINFORCEMENT.
Birmingham Slag Co.
Truscon Steel Co.

CEMENT AND BRICK COATING.
American Cement Paint Co.
Dixon Crucible Co., Jos.
St. Louis Surfacer & Paint Co.
Hockaday Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

CENTRAL STATION (ELECTRIC).
Alabama Power Co.
Georgia Railway & Power Co.
Tennessee Electric Power Co.

CENTRIFUGALS.
Cresson-Morris Co.
Fletcher Works.
Goulds Mfg. Co.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

CHAIN DRIVES.
(See Belting—Chain Link.)

WRITE US
for catalog on
other
Mill Receptacles.

No-Waste
SEAMLESS ROVING CANS

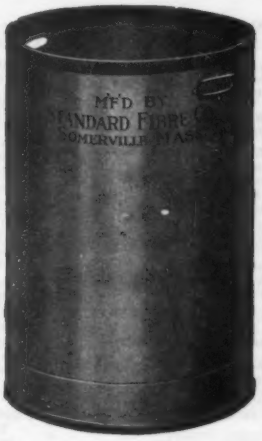
Waste Baskets
Taper Baskets
Oval Cans
Elliptical Cans

Sizes
9"-10"-11"-12"-14"-18"
diameters
and
up to 45" high

NO
seams, joints,
or
Rivets.

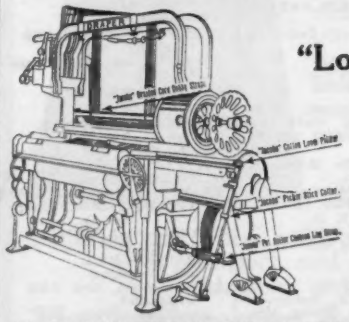
Styles

Polished
Steel
or
Rolled Fibre
Top Rims
Rings
BEADED
securely
to
Hard Fibre
Shells.



Hard Fibre
MILL BARRELS
Plain Fibre
and
NEW PATTERN
Steel Clad
Trucks and Boxes
Combination
Doffing Cars

STANDARD FIBRE CO.
Somerville, Massachusetts



Our
"Loom Supplies"
are used by Draper Corporation, Crompton & Knowles, Mason Machine Works, Stafford Company, Hopedale Mfg. Co., and carried in stock by all the largest Supply Houses.

E. H. JACOBS MANUFACTURING COMPANY
DANIELSON, CONNECTICUT

Morehead
Back to Boiler
SYSTEM
Improved Drainage

Better drainage of your cans, dryers and slashers—with increased production per pound of steam and lower fuel costs—is a certainty with the Morehead Back-to-Boiler System.
Write for complete information.
Morehead Manufacturing Company
Dept. C, Detroit, Michigan
(66)

WELLS
HUGHES SPECIALTY WELL DRILLING CO.
CHARLESTON ATLANTA
Established 1885

ADVERTISING is an economy and cuts the cost of selling, making lower prices or better goods possible without sacrifice of the sellers' profits.

F. W. LAFRENTZ & COMPANY
announce that they
will handle all Auditing, Accounting, Systematizing and Tax Work heretofore done by them under the name of The American Audit Company.
F. W. Lafrentz, C. P. A. (N. Y.)
A. F. Lafrentz, C. P. A. (N. Y.)
C. B. Bidwell, C. P. A. (Ga.)
AT
1013 Fourth National Bank Bldg.
Atlanta, Ga.
'Phone Walnut 0869

BUYERS' INDEX—Continued.

CHAIN—BLOCK, BICYCLE, AUTO, ENGINE, AGRICULTURAL, ETC.
Link Belt Co.
Morse Chain Co.
Renold, Inc., Hans.

CHAIRS AND STOOLS.
(See Furniture—Mill.)

CHECK STRAPS.
Bond Co., Chas.
Hayes Loom Reed & Harness Co.
Jacobs Mfg. Co., E. H.

CHEMICALS.
(See Dyestuffs and Chemicals.)

CHLORINE GAS.
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

CLEANING AND AERATING MACHINE FOR COTTON.
Murray Company, The.

CLEARER CLOTH.
Philadelphia Felt Co.

CLOCKS—HANK, ETC.
(See Counters.)

CLOCKS (TIME).
Root Co.
Silberberg, Mortimer J.

CLOCKS—WATCHMAN.
Foxboro Co., Inc.
Root Co.

CLOSETS—WATER.
(See Toilets.)

CLOTH—ROLLER, CLEARER, SLASHER.
Philadelphia Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Foster Machine Co.
Wildman Mfg. Co.

CLOTH REELS.
Gallaudet Aircraft Corp.

CLOTH ROOM MACHINERY.
Brooks & Doxey, Ltd.
Butterworth, H. W., & Sons Co.
Firsching, J. A.
Foster Machine Co.
Hopedale Mfg. Co.
Lord Bros.
Manufacturers Machine Co.
Saco-Lowell Shops.
Textile Finishing Mchry. Co.
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch. Wks.

CLOTH TESTERS.
Scott Co., Henry L.

CLOTH WINDERS.
(See Winders.)

CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Mason, Volney W.
Wood's Sons Co., T. B.

CLUTCH LININGS.
Carlyle-Johnson Mch. Co.

COAL AND ASH HANDLING MACHINERY.
Godfrey Conveyor Co.
Link-Belt Company.

COAL TAR DISINFECTANTS
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
(See Aprons.)

COMBERS AND COMBER SUPPLIES.
Belger Co.
Foster Machine Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Wks.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

COMPRESSORS—AIR, GAS, ETC.
Allis-Chalmers Mfg. Co.
Curtis Pneumatic Mchry. Co.
General Electric Co.
Gould's Mfg. Co.

COMMUTATOR BRUSHES.
(See Brushes—Motor and Generator.)

CONCRETE REINFORCEMENT.
Birmingham Slag Co.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDUITS.
(See Elec. Machinery & Supplies.)

CONE (KNITTING YARN).
Foster Mch. Co.

CONE WINDING MACHINE.
(See Winding Machinery.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

CONSULTANTS (BUSINESS METHODS).
Ernst & Ernst.

CONSULTING ENGINEERS
(See Architects and Engineers)

CONTRACTORS AND ENGINEERS—BUILDING.
Foundation Co.
Sirrine & Co., J. E.
Stuhrman, Edw. A.
Truscon Steel Co.

CONTRACTORS—ELECTRICAL.
(See Electrical Engineers.)

CONTRACTORS (HEATING & PLUMBING.)
Walker Electric & Plb. Co.

CONTROLLING INSTRUMENTS—TEMPERATURE.
Bristol Co.
Foxboro Co., Inc.
General Electric Co.
Mason-Brown Co., B. P.
Taylor Instrument Co.

CONVEYORS—BELT.
(See Belt Conveyors.)

CONVEYING MACHINERY.
American Supply Co.
Chisholm-Moore Mfg. Co.
Collins, J. D.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Euclid Crane & Hoist Co.
Godfrey Conveyor Co.
Link-Belt Co.
Mason, Volney W.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Renold, Hans.
Schofield, Wm., Co.

CONVEYORS—PORTABLE.
Euclid Crane & Hoist Co.
Link-Belt Co.

COOLERS.
(See Humidifying Apparatus.)

COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING EQUIPMENT.
American Blower Co.
Buckeye Blower Co.
Manufacturers Machine Co.
Sturtevant Co., B. F.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

CORDAGE MACHINERY.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

COST SYSTEMS.
Ernst & Ernst.

COTTON CLEANING AND AERATING MACHINE.
Murray Company, The.

COTTON FANS.
(See Blowers.)

COTTON YARN AND CLOTH COMMISSION MERCHANTS AND DEALERS.
Aberfoyle Mfg. Co.
Boger & Crawford.
Callaway Mills.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Lane & Co., J. H.
Southern Yarn Co.
Tolar & Hart.
Weimar Bros.
Wellington, Sears & Co.
Woodward, Baldwin & Co.

COTTON MERCHANTS AND BROKERS.
Beer & Co., H. & B.

COTTON MILL MACHINERY AND SUPPLIES.
Allen Co.
American Blower Co.
Atlanta Harness & Reed Mfg. Co.
Auto Creel Corp
Barber-Colman Co.
Belger Co.
Brooks & Doxey, Ltd.
Butterworth & Sons, H. W.
Crompton & Knowles Loom Works.
Draper Corporation.
Dryer Corp. of America.
Durant Mfg. Co.
Eclipse Textile Devices, Inc.
Firsching Co., J. A.
Fletcher Works.
Foster Machine Co.
Foxboro Co., Inc.
Gallaudet Aircraft Corp.
Greist Mfg. Co.
Hayes Loom Reed & Harness Co.
Hopedale Mfg. Co.
Howard & Bullough.
Hunt Machine Co., Rodney.
Hyatt Roller Bearing Co.
Jacobs Mfg. Co., E. H.
Lestershire Spool & Mfg. Co.
Lord Bros.
Lowell Crayon Co.
Manufacturers Machine Co.
Mates-Brown Co., Inc., B. P.
Mossberg Pressed Steel Corp.
National Vulcanized Fibre Co.
Parker Co., Walter L.
Phila. Drying Mchry. Co.
Philadelphia Felt Co.
Proctor & Schwartz, Inc.
Root Co.
Roy & Son, B. S.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Stafford Co.
Steel Heddle Mfg. Co.
Sturtevant Co., B. F.
Suter, Alfred.
Terrell Machine Co.
Textile Finishing Machinery Co.
Tolhurst Mch. Wks.
Universal Winding Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.
Washburn & Sons, L. R.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

COTTON TAPE LOOM.
Fletcher Works.
Foster Mch. Co.
Schaum & Uhlinger.

COTTON YARN MILLS.
(See Yarn Manufacturers.)

COUNTERS—REVOLUTION, HANK, PICK, ETC.
Bristol Co.
Durant Mfg. Co.
Foxboro Co.
Root Co.

COUNTERS—RESTAURANT.
(See Restaurant Equipment.)

COUPLING—SHAFT.
Cresson-Morris Co.
Wood's Sons Co., T. B.

COVERING—ROLLER.
Bond Co., Chas.
Philadelphia Felt Co.

CRANES.
(See Hoists.)

CRAYONS.
Lowell Crayon Co.

CREELS
Auto Creel Corp.
Suter, Alfred.
Warp Compressing Mch. Co.

CREOSOTED FLOORING, BLOCKS, POSTS, SHINGLES, ETC.
Southern Wood Preserving Co.

CUTS FOR PRINTING.
Jacobs & Co.

CUTTERS—CLOTH.
(See Cloth Cutters.)

CUTTERS—THREAD.
(See Thread Cutters.)

DEHUMIDIFIERS.
American Moistening Co.
Sturtevant Co., B. F.

DELIVERY CASES.
(See Boxes—Packing.)

DESKS—FACTORY.
Lupton's Sons Co., David.

DEXTRINES.
See Dyestuffs and Chemicals.)

DIAL SCALES.
(See Scales.)

DIES—STEEL.
(See Stamps, Stencils, Etc.)

DIE STOCKS.
(See Pipe Threaders.)

DISINFECTANTS.
Barrett Co., The.

DOBBY CHAINS.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOBBY CARDS.
Jacobs Mfg. Co., E. H.

DOFFING BOXES—MILL.
(See Boxes—Mill.)

DOFFING CANS.
(See Cans.)

DOORS—STEEL.
Lupton's Sons Co., David.

DOUBLING MACHINERY.
Brooks & Doxey, Ltd.
Lord Bros.

DRAWINGS AND ARTWORK.
Jacobs & Co.

DRAWING FRAMES.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

DRILLS—ELECTRIC.
(See Electric Machinery.)

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

DROP WIRES.
Draper Corp.
Greist Mfg. Co.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

DRYING APPARATUS.
American Blower Co.
Buckeye Blower Co.
Dryer Corp. of America.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sturtevant Co., B. F.

DRYING FORMS—HOSIERY.
Pearson, Jos. T.

DRYING MACHINERY AND EQUIPMENT.
American Blower Co.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Cocker Mch. & Fdry. Co.
Dryer Corp. of America.
Manufacturers Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp, C. G.
Sturtevant Co., B. F.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
(See Blowers and Blowing Systems.)

DUSTING MACHINERY.
Proctor & Schwartz, Inc.
Schofield Co., Wm.

DYERS, BLEACHERS AND FINISHERS.
American Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Franklin Process Co.

DYEING, BLEACHING, FINISHING AND PRINTING MACHINERY AND EQUIPMENT.
American Laundry Mchry. Co
Brandwood, John.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Cole Mfg. Co., R. D.
Dryer Corp. of America.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Macomb Machine Co.
Manufacturers Machine Co.
Monaghan, Jas. F.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Woolford Wood Tank Co., G.

DYEING MACHINES (PACKAGE AND SPOOL).
Brandwood, John.
Franklin Process Co.

DYE STICKS.
Phila. Drying Machinery Co.

DYE VATS AND TUBS.
(See Tanks or Bleaching Kiers)

DYESTUFFS AND CHEMICALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Electro Bleaching Gas Co.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Mates-Brown Co., Inc., B. P.
Metz & Co., H. A.
National Aniline & Chemical Co.
Roessler & Hasslacher Chemical Co.
Rohm & Haas Co.
Sandoz Chemical Co.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.

EFFICIENCY ENGINEERS.
Sherman Service, Inc.

ELECTRIC CONDUIT AND FITTINGS.
(See Electrical Machinery and Supplies.)

ELECTRIC DYNAMOS AND MOTORS.
(See Motors and Generators.)

ELECTRIC FANS.
(See Fans—Electric.)

ELECTRIC LAMPS.
(See Lamps.)

ELECTRIC LAMP GUARDS.
Ivanhoe Regent Works.

ELECTRICAL ENGINEERS AND CONTRACTORS.
Curtis, Paul W.
Huntington & Guerry, Inc.
Walker Electric & Plbg. Co.

ELECTRIC LIGHTING ENGINEERS.
(See Illuminating Engineers.)

ELECTRICAL MACHINERY, INSTRUMENTS AND SUPPLIES.
Allis-Chalmers Mfg. Co.
American Blower Co.
Blake Electric Mfg. Co.
Bristol Co.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Cutler Works, George.
Euclid Crane & Hoist Co.
Federal Electric Co.
General Electric Co.
Ivanhoe-Regent Works.
Mason, Volney W.
Sturtevant Co., B. F.
Walker Electric & Plbg. Co.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

ELECTRIC POWER.
(See Power.)

ELECTRIC PRESSES (HIGH PRESSURE).
Rex Eng'g Corp.

ELECTRIC TRACTORS AND TRUCKS.
(See Tractors and Trucks—Electric.)

ELECTROTYPES.
Jacobs & Co.

ELEVATORS—PORTABLE.
Collins, J. D.
Euclid Crane & Hoist Co.

ELEVATORS.
Link-Belt Company.

ENAMELED IRON AND GLASS FOR TEXTILE MACHRY.
Mitchell-Bissell Co.

ENAMEL—MILL WHITE.
(See Paint.)

ENGINEERS—MILL.
(See Architects.)

ENGINES—OIL, GAS AND GASOLINE.
Allis-Chalmers Mfg. Co.

ENGINES (STEAM).
Allis-Chalmers Mfg. Co.
American Blower Co.
Cole Mfg. Co., R. D.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.

ENGINE ROOM APPLIANCES AND SUPPLIES.
American Blower Co.
Casey-Hedges Co.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.
Westinghouse Elec. & Mfg. Co.

ENGINEERS (CONSULTANT AND EFFICIENCY).
Ernst & Ernst.

ETCHING—(PRINTING).
Jacobs & Co.

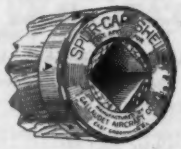
ENGRAVING AND CUTS.
Jacobs & Co.

EXHAUSTERS.
(See Blowers.)

EXPORTERS—COTTON.
(See Brokers.)

EXTRACTORS—HYDRO.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

FACTORY DESKS.
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.



Pat. Applied for

SPUR-CAP SHELLS

Made to Stand the Hard Knocks

MANUFACTURED BY

GALLAUDET AIRCRAFT CORP'N.,

EAST GREENWICH, R. I.

FEATHERBOARD

The Master Cloth Reel

LIGHT AND STRONG. IMPROVES YOUR PUT UP.

THE

"Southwestern" Iron Clad

Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT!
PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through all principal distributors.

The Southwestern Broom Mfg. Co.
Evansville, Indiana

UCPC

Direct, Sulphur, Chrome } **Dyes** { Acid, Vat, Basic

Special Shades Matched

VELVETEEN

The Best Boil-off and Finish

Softeners *Oils* *Finishes*

UNITED CHEMICAL PRODUCTS CORPORATION

Importers, Exporters and Manufacturers

York & Colgate Sts. Jersey City, N. J.

Southern Office, 307 Commercial National Bank Building Charlotte, N. C.

REPRESENTATIVES:
R. T. GRANT, Charlotte, N. C.
GEO. W. WATSON, Hazlehurst, Miss.
C .D. MAIGATTER, Charlotte, N. C.

ALL STEEL ECONOMY FIRE PROOF

BALING PRESSES

ALL SIZES FOR ALL PURPOSES

LARGEST LINE BUILT IN U.S.A.

ECONOMY BALER CO., DEPT C ANN ARBOR, MICH., U.S.A.

WATER

WE-FU-GO AND SCAIFE

PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

BUYERS' INDEX—Continued.

FACTORY & INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Tennessee Electric Power Co.
Nashville Industrial Corp.

FACTORY MANAGEMENT SYSTEMS.
Ernst & Ernst.

FANS—ELECTRIC.
American Blower Co.
Buckeye Blower Co.
Carter Electric Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

FANS—CONVEYING, POWER AND EXHAUST.
(See Blowers and Blowing Systems.)

FASTENERS—BELT.
(See Belt Fasteners.)

FEED WATER PURIFIERS.
(See Boiler Feed Water Purification.)

FEEDERS.
(See Automatic Feeders.)

FELT CLOTH FOR ROLLS.
Philadelphia Felt Co.

FELTING MACHINERY.
Proctor & Schwartz, Inc.

FENCE—STEEL AND IRON.
Anchor Post Iron Works.
Knapp Fence Co.

FENCE POSTS—CREOSOTED PINE.
Southern Wood Preserving Co.

FIBRE PRODUCTS.
National Vulcanized Fibre Co.
Standard Fibre Co.

FILLING—CAP AND WARP.
U. S. Bobbin & Shuttle Co.

FILLING STATION PUMPS.
Bowser & Co., S. F.

FILTERS—WATER.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

FILTERS—OIL REMOVAL.
Norwood Engineering Co.

FILTERS (ALUM).
Lennig & Co., Chas.

FINISHING.
(See Dyers, Bleachers and Finishers.)

FINISHING, BLEACHING AND SIZING MATERIALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Corn Products Refining Co.
Electro Bleaching Gas Co.
Ferd Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Lennig & Co., Chas.
Mates-Brown Co., Inc., B. P.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Roessler & Hasslacher Co.
Rohm & Haas Co.
Sandoz Chemical Co.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

FIRE DOORS AND HARDWARE.
Lupton Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.

FIRE HOSE.
(See Hose—Fire.)

FIRE PROTECTING PAINT.
(See Paint.)

FLAX SPINNING.
U. S. Bobbin & Shuttle Co.

FLEXIBLE COUPLINGS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.

FLOOD LIGHTS—ELECTRIC.
Cooper Hewitt Electric Co.
Ivanhoe Regent Works.
General Electric Co.

FLOORING LUMBER.
Hightower Box & Tank Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

FLOORING (TILE & BRICK).
National Paving Brick Co.

FLOORING—WOOD BLOCKS.
Southern Wood Preserving Co.

FLOOR SCRUBBING MACHINE
American Scrubbing Equipment Co.

FLOOR SCRUBBING POWDERS.
(See Scrubbing Powders.)

FLOOR SWEEPS.
(See Brushes.)

FLUTED ROLLS.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FLYERS.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FOUNDERS.
Briggs-Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdy. & Mch. Wks.

FOUNTAINS—DRINKING.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

FRICTION CLUTCHES.
(See Clutches—Friction.)

FUEL ECONOMIZERS.
Sturtevant Co., B. F.

FURNITURE—MILL.
Allen Co.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

FUSES—ELECTRIC.
Carter Electric Co.
Federal Electric Co.

GARNETT MACHINES.
Proctor & Schwartz, Inc.

GAS ENGINES.
(See Engines—Gas.)

GASOLINE PUMPS AND STORAGE TANKS.
Bowser & Co., S. F.

GAUGE (YARN CLEANER).
Mates-Brown Co., Inc., B. P.

GAUGES—STEAM PRESSURE, ETC.
Bristol Co.
Foxboro Co., Inc.
Taylor Instrument Co.

GAUGE—OIL.
Lunkenheimer Co.

GAUGES—WATER.
Lunkenheimer Co.

GEARS—SILENT.
General Electric Co.
Link-Belt Company.
Morse Chain Co.
Renold, Hans.

GEAR CUTTING AND CUTTERS.
Cresson-Morris Co.

GEAR PULLERS.
General Electric Co.

GENERATORS—ELECTRIC.
(See Motors and Generators.)

GLASSWARE AND DISHES.
(See Dishes.)

GOVERNORS—PUMP.
General Electric Co.

GRAPHIC CHARTS.
Ernst & Ernst.

GRAPHITE.
Dixon Crucible Co., Jos.

GRATES—BOILER.
Casey-Hedges Co.
Cole Mfg. Co., R. D.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

GRATES—MECHANICAL.
(See Stokers.)

GREASE.
(See Lubricants.)

GREASE CUPS.
(See Lubricators.)

GRINDER—CARD, CYLINDER, ROLL, NAPPER AND GARNET.
(See Card Grinding Machinery.)

GUARDS—ELECTRIC LAMP.
(See Electric Lamp Guards.)

GUARDS — MACHINE, SKYLIGHT, WINDOW, ETC.
Anchor Post Iron Works.
Knapp Fence Co.

GUIDES—THREAD.
Mitchell-Bissell Co.
Palmer Co., I. E.

GUMS.
(See Finishing and Sizing Materials.)

HALFTONES—PRINTING.
Jacobs & Co.

HANGERS.
(See Shafting and Hangers.)

HANK CLOCKS.
(See Counters.)

HARDWARE—BUILDING.
Sanymetal Products Co.

HARNESS—LOOM.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Works.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Hayes Loom Reed & Harness Co.

HEADS—BOBBIN AND SPOOL.
Allen Co.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
U. S. Bobbin & Shuttle Co.

HEATING AND VENTILATING APPARATUS.
(See Ventilating Apparatus.)

HEATING & PLUMBING CONTRACTORS.
Walker Electric & Plbg. Co.

HEDDLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HEDDLE FRAMES.
Crompton & Knowles Loom Works.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HOISTS.
Chisholm Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Euclid Crane & Hoist Co.
Link-Belt Company.
Mason, Volney W.
Morse Chain Co.

HOPPER FEEDERS.
(See Automatic Feeders.)

HORNS AND MUSICAL INSTRUMENTS.
Cable Piano Co.
Conn, Ltd., C. G.

HOSE—FIRE.
Collins, J. D.

HOSIERY DYEING MACHINERY.
Cole Mfg. Co., R. D.
Franklin Process Co.
Philadelphia Drying Mchry. Co.

HOSIERY FORMS.
(See Drying Forms.)

HOSIERY LABELS, BANDS, STICKERS, ETC.
Kirby-Cogeshall Co.

HOSIERY PACKING.
Kirby-Cogeshall Co.

HOSIERY YARNS.
(See Yarn Manufacturers.)

HOTELS.
Hotel Cecil.
Hotel Martinique.
Hotel Sheridan Plaza.
Hotel Tuller.

HUMIDIFYING APPARATUS.
American Blower Co.
American Moistening Co.
Carrier Eng. Corp.
Manufacturers Machine Co.
Mates-Brown Co., B. P.
Parks-Cramer Co.
Sturtevant Co., B. F.

HUMIDIFYING INDICATING INSTRUMENTS.
Bristol Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

HYDRODEIKS.
Taylor Instrument Co.

HYGROMETERS.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

HYDRAULIC TURBINES.
(See Turbines—Hydraulic.)

HYDRO EXTRACTORS.
(See Extractors.)

ILLUMINATING ENGINEERS.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Huntington & Guerry.
Ivanhoe-Regent Works.
Walker Elec. & Plb. Co.
Westinghouse Elec. & Mfg. Co.

INDICATING AND RECORDING INSTRUMENTS AND THERMOMETERS.
Bristol Co.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Root Co.
Taylor Instrument Co.

INDIGO.
(See Dyestuffs and Chemicals.)

INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Nashville Industrial Corp.
Tennessee Electric Power Co.

INDUSTRIAL COORDINATION SERVICE.
Sherman Service, Inc.

INJECTORS.
Lunkenheimer Co.

INK—STENCIL AND MARKING.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

IRON WORK—ORNAMENTAL.
Anchor Post Iron Works.
Dufur & Co.
Knapp Fence Co.
Lombard Iron Works & Supply Co.
Royal Metal Mfg. Co.

JACK SPOOLS.
(See Spools.)

JACQUARDS.
Crompton & Knowles Loom Works.

JOINT COMPOUND.
Dixon Crucible Co., Jos.

JUTE BAGGING MACHINE.
Proctor & Schwartz, Inc.

KETTLES—SIZE.
(See Size Kettles.)

KETTLES—SODA.
Lombard Iron Works & Supply Co.

KIERS.
(See Bleaching Kiers.)

KNIT GOODS.
(See Cotton Cloth Commission Merchants and Dealers.)

KNIT GOODS WASHERS.
(See Washers—Cloth.)

KNITTING MACHINERY AND SUPPLIES.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Kirby-Cogeshall Co.
Scott & Williams.
Torrington Co.
Trump Bros. Machine Co.
Wildman Mfg. Co.

KNITTING NEEDLES.
Torrington Co.

LABELS FOR HOSIERY, BOXES, ETC.
Kirby-Cogeshall Co.

LABORATORY INSTRUMENTS.
Bristol Co.
Scott & Co., Henry L.
Foxboro Co., Inc.
Root Co.
Taylor Instrument Co.

LACING—BELT.
(See Belt Lacing.)

LAMPS—INCANDESCENT AND ARC.
Carter Electric Co.
Cooper Hewett Electric Co.
Curtis, Paul W.
Cutter Works, George.
General Electric Co.
Ivanhoe-Regent Works of G. E. Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

LAMP GUARDS—KEY LOCKING.
(See Electric Lamp Guards.)

LAMP REFLECTORS.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Cutter Works, George.
Ivanhoe-Regent Works of G. E. Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

LANDSCAPE ARCHITECTS.
(See Village Architects.)

LAPPERS.
Brooks & Doxey, Ltd.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

LAUNDRY MACHINERY.
American Laundry Mchry. Co.
Fletcher Works.
Hunt Machine Co., Rodney.
Schaum & Uhlinger.
Tolhurst Machine Works.

LAVATORIES.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Vogel Co., Jos. A.

LEATHER BELTING.
(See Belting.)

LEATHER SPECIALTIES.
American Supply Co.
Bond Co., Chas.
Jacobs Mfg. Co., E. H.
Williams & Sons, I. B.

LIGHTS—FLOOD.
Cutter Works, George.
Cooper Hewitt Electric Co.
General Electric Co.
Ivanhoe-Regent Works.
Westinghouse Elec. & Mfg. Co.

LIGHTING ENGINEERS AND CONTRACTORS.
(See Illuminating Engineers.)

LINEN YARNS.
(See Yarns Linen.)

LINK BELTING.
(See Belting—Link.)

LINTERS.
(See Waste Dealers.)

LIQUID CHLORINE.
(See Chlorine.)

LOADERS—WAGON AND TRUCK.
Link-Belt Company.

LOCKERS—METAL.
Collins, J. D.
Lupton Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

LOGWOOD EXTRACT.
(See Dyestuffs and Chemicals.)

LOOMS.
Compton & Knowles Loom Works.
Draper Corporation.
Fletcher Works.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

LOOM ATTACHMENTS—AUTOMATIC.
Draper Corporation.
Hopedale Mfg. Co.

LOOM HARNESS.
(See Harness.)

LOOP PICKERS.
Jacobs Mfg. Co., E. H.

LUBRICANTS.
Dixon Crucible tCo., Jos.
Lamson Oil Co., Inc.
Masury-Young Co.
N. Y. & N. J. Lubricant Co.
Texas Co.

LUBRICATORS.
Bowser & Co., S. F.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

LUG STRAPS.
(See Straps—Lug.)

LUMBER.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

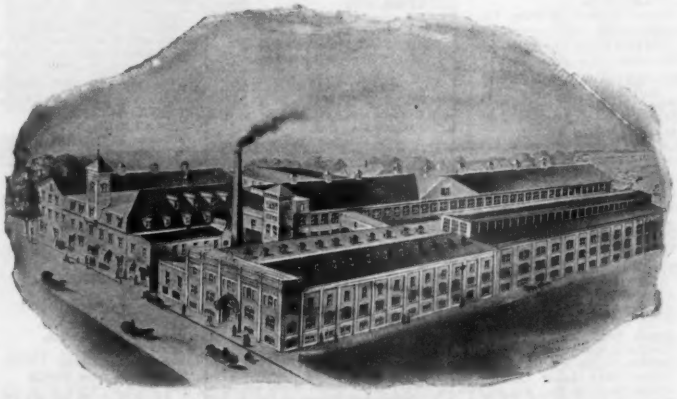
LUNCH ROOM EQUIPMENT.
(See Restaurant.)

MACHINE GUARDS.
Anchor Post Iron Works.
Knapp Fence Co.

MACHINE TOOLS.
(See Tools.)

We are ALWAYS READY to Supply You
WITH QUALITY

COTTON HARNESS, MAIL HARNESS, SELVEDGE HARNESS, REEDS, SLASHER AND STRIKING COMBS, WARPER AND LIECE REEDS, BEAMER AND DRESSER HECKS, MENDING EYES, JACQUARD HEDDLES, ETC. Submit your requirements to us for prices.



Remember, this big plant is working for you—striving to give you the utmost in quality and satisfaction. When you buy of us, you are assured of the very best that skilled labor, modern methods and machinery can produce.

Southern Representative
Geo. F. Bahan

EMMONS LOOM HARNESS CO.
LAWRENCE, MASS.
SOLE AGENTS FOR WARDWELL PICKERS.
The Largest Manufacturers of Loom Harness and Reeds in America.

EMMONS LOOM HARNESS AND REEDS

B Y C
TRADE MARK

BARBER-COLMAN COMPANY

Main Office and Factory
Rockford, Ill.

Boston, Mass. **Greenville, S. C.**

WARP TYING MACHINES
WARP DRAWING MACHINES
HAND KNOTTERS FOR SPOOLING AND WINDING

A Complete Musical Merchandising Service

FEW cities, regardless of size, enjoy a musical merchandising service such as this great store provides. Every known form of musical instrument and musical accessory is here for use in Community Welfare Work.

The Euphona Reproducing Inner-Player Piano is especially adapted for use in Recreation Rooms, Assembly Halls, Rest Rooms, etc. It can be played with electricity—as a foot-operated player piano or as an ordinary piano.

CABLE
Piano Company
82-84 N. BROAD ST. ATLANTA, GA.

SOFT WATER - CLEAR WATER
FOR EVERY PURPOSE

DEC ALSO ZERO WATER SOFTENERS
LIME AND SODA WATER SOFTENERS
PRESSURE AND GRAVITY FILTERS

SOFTENER

FOR PARTICULARS ADDRESS
AMERICAN WATER SOFTENER CO.
LEHIGH AVE. AT 4TH. ST.
PHILADELPHIA, PA.

FILTER

FOR TEXTILE MILL FLOORING

TUPELO
"THE HARD-WEAR LUMBER"

has about every advantage. It always makes good. Because of its "involved" grain it resists severe friction for lots of profitable years, without slivering or splintering. Get all the facts. Write

SOUTHERN CYPRESS MFRS. ASSOCIATION
805 Poydras Building, New Orleans, La., or
805 Graham Building, Jacksonville, Fla.

BUYERS' INDEX—Continued.

MACHINISTS.
Briggs-Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Works.

MARKING POTS, STENCILS, INKS, ETC.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

MERCERIZED YARNS.
(See Yarn Manufacturers).

MERCERIZERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co.
Bogor & Crawford.
Dixie Mercerizing Co.

MERCERIZED YARN.
Aberfoyle Mfg. Co.
American Yarn & Pro. Co.
Bogor & Crawford Co.
Dixie Mercerising Co.
Hunter Mfg. & Comm. Co.
United Piece Dye Wks.

MERCERIZING MACHINERY.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

METAL CEILINGS, ETC.
Lupton's Sons Co., David.
Truscon Steel Co.

METALS—PERFORATED.
(See Screens and Sieves.)

METERS—FLOW, AIR, GAS, ELECTRIC, STEAM, ETC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

METERS—COUNTING.
(See Counters.)

MILL BASKETS AND BOXES.
(See Boxes—Mill.)

MILL ENGINEER.
(See Architects and Engineers.)

MILL VILLAGES.
(See Villages.)

MILL SUPPLIES—MISCELLANEOUS.
(See Supplies—Mill.)

MILL WHITE PAINT.
(See Paint.)

MOPS.
Atlanta Brush Co.
Southwestern Broom Mfg. Co.

MOTION PICTURES.
(See Films.)

MOTORS AND GENERATORS—ELECTRIC.
Allis-Chalmers Mfg. Co.
American Blower Co.
Carter Electric Co.
Curtis, Paul W.
General Electric Co.
Nashville Industrial Corp.
Sturtevant Co., B. F.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

MOVING PICTURE MCH. AND SUPPLIES.
(See Theatre Equipment.)

NAPPER ROLL GRINDING MACHINES.
(See Card Grinders.)

MUSICAL INSTRUMENTS.
Cable Piano Co.
Conn, Ltd., C. G.

NEEDLES—KNITTING.
Torrington Co.

OFFICE EQUIPMENT & SUPPLIES.
Jacobs & Co.
Knapp Fence Co.
Lupton's Sons Co., David
Monroe Calculating Mch. Co.
Royal Metal Mfg. Co.
Smith & Bros. Typewriter Co.
Sanymetal Products Co.

OFFICE PARTITIONS.
(See Partitions.)

OIL—LUBRICATING.
Johnson & Co., Inc., Oliver.
Lamson Oil Co., Inc.
Masury-Young Co.
Texas Co.
Wadsworth, Howland & Co., Inc.

OIL ENGINES.
(See Engines Oil.)

OILS—FINISHING.
(See Finishing and Sizing Materials.)

OIL CUPS.
(See Lubricators.)

OIL PAPER.
Bradley Mfg. Co., A. J.

OIL SEPARATORS.
(See Separators.)

OIL STORAGE TANKS AND PUMPS.
Bowser & Co., S. F.

OILING DEVICES.
(See Lubricators.)

OPENING MACHINERY—COTTON, WOOL, WASTE, ETC.
Brooks & Doxey, Ltd.
Lord Bros.
Murray Company, The.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

OVERHEAD CARRIERS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.

OXIDIZING MACHINERY.
Phila. Drying Machinery Co.

OXYGEN.
Bird-Potts Co., Inc.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

PACKING BOXES AND CASES—WOODEN.
Hightower Box & Tank Co.
Lewis Co., G. B.

PACKINGS.
Jenkins Bros.

PAINT.
American Cement Paint Co.
Barrett Co., The.
Dixon Crucible Co., Jos.
Hockaday Co.
Johnson & Co., Oliver.
St. Louis Surfacer & Paint Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

PAINTING CONTRACTORS.
(See Contractors.)

PANEL BOARDS.
(See Switchboards.)

PAPER.
Bradley Mfg. Co., A. J.

PARTITIONS—STEEL AND WIRE.
Anchor Post Iron Works.
Knapp Fence Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

PERBORATE OF SODA.
Roessler & Hasslacher Chemical Co.

PERFORATED METAL.
(See Screens and Sieves.)

PEROXIDES.
Roessler & Hasslacher Chemical Co.

PICK COUNTERS.
(See Counters.)

PICKERS—CURLED HAIR.
Proctor & Schwartz, Inc.
Schofield Co., Wm.

PICKERS—LEATHER.
Bond Co., Chas.
Garland Mfg. Co.
Jacobs Mfg. Co., E. H.

PICKER LOOPS.
Jacobs Mfg. Co., E. H.

PICKER STICKS.
Garland Mfg. Co.

PICKING MACHINERY.
Brooks & Doxey, Ltd.
Howard & Bullough Am. Machine Co.
Lord Bros.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

PINIONS.
General Electric Co.

PIPE—STEEL RIVETED.
Youngstown Sheet & Tube Co.

PIPE AND PIPE FITTINGS.
Crane Co.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walker Electric & Plbg. Co.

PIPE JOINT COMPOUND.
Dixon Crucible Co., Jos.

PIPING—COTTON.
Youngstown Sheet & Tube Co.

PIPING ENGINEERS.
Walker Electric & Plbg. Co.

PIPE BENDING.
Youngstown Sheet & Tube Co.

PLAYGROUND APPARATUS & EQUIPMENT.
Crane Co.
Hill Standard Co.
Manufacturing Equip. & Eng'g. Co.
Royal Metal Mfg. Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

PLUMBING & HEATING CONTRACTORS.
Walker Electric & Plbg. Co.

PNEUMATIC COLLECTING & CONVEYING SYSTEMS.
Sturtevant Co., B. F.

PNEUMATIC MACHINERY & TOOLS.
Curtis Pneumatic Mchry. Co.

PORCELAIN GUIDES.
Mitchell-Bissell Co.

PORTABLE CONVEYORS.
(See Conveyors.)

POSTS—FENCE (WOOD.)
Southern Wood Preserving Co.

POWER—ELECTRIC.
Alabama Power Co.
Georgia Ry. & Power Co.
Tennessee Electric Power Co.

POWER TRANSMISSION EQUIPMENT.
Aldrich Machine Works.
Allis-Chalmers Mfg. Co.
Bond Co., Chas.
Brown Co., A. & F.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Clipper Belt Lacer Co.
Dixon Crucible Co., Jos.
Fafnir Bearing Co.
General Electric Co.
Grinnell Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.
Rhoads & Sons, J. E.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.
Wood's Sons Co., T. B.

PRESERVATIVE PAINT FOR METAL WORK.
(See Paints.)

PRESSED STEEL.
Lupton's Sons Co., David.

PRESSES.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Logemann Bros. Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Rex Eng'g Corp.
Textile Finishing Machinery Co., The.

PRESSURE GAUGES.
(See Gauges.)

PRESSURE REGULATORS.
(See Regulators—Pressure.)

PRINTERS (CLOTH).
(See Dyers.)

PRINTING.
Jacobs & Co.
Showalter Printing Co., A. J.

PRINTING EXTRACTORS—HYDRO.
Tolhurst Machine Works.

PROPELLER FANS.
(See Blowers.)

PSYCHROMETERS.
Bristol Co.

PULLEYS.
Cole Mfg. Co., R. D.
Dodge Sales & Eng. Co.
Cresson-Morris Co.
Link-Belt Company.
Mason, Volney W.
Renold, Inc., Hans.
Wood's Sons Co., T. B.

PULLEY COVERING.
Williams & Sons, I. B.

PUMPS.
Allis-Chalmers Mfg. Co.
Bowser & Co., S. F.
Goulds Mfg. Co.
Sydnor Pump & Well Co., Inc.
Toomey, Frank.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

PUMPS—OIL.
Bowser & Co., S. F.
Lunkenheimer Co.

PUMP VALVES.
(See Valve Discs.)

PYROMETERS.
Bristol Co.
Foxboro Co.
Taylor Instrument Co.

QUILLS.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.

QUILL CLEANING MACHINES.
Terrell Machine Co.

RAILWAYS.
A. B. & A. Ry.
A. & W. P. Ry.
Central of Ga. Ry.
Georgia Railroad.
Southern Railway System.

RAW STOCK DRYING SYSTEMS.
Brandwood, John.

RECEPTACLES—FIBRE.
(See Fibre Products.)

RECORDING INSTRUMENTS.
Bristol Co.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

REEDS.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Emmons Loom Harness Co.
Hayes Loom Reed & Harness Co.

REELS.
Crompton & Knowes Loom Works.
Draper Corporation.
Gallaudet Aircraft Corporation.
Hunt Machine Co., Rodney.
Mossberg Pressed Steel Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

REFLECTORS—LAMPS.
(See Lamp Reflectors.)

REGULATORS—LIQUID LEVEL.
Foxboro Co., Inc.
General Electric Co.

REGULATORS—PRESSURE.
Bristol Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

REGULATORS—TEMPERATURE.
(See Temperature Controllers.)

REINFORCING SLAG.
Birmingham Slag Co.

REPAIRING—ELECTRICAL
Briggs-Shaffner Co.
Curtis, Paul W.
Huntington & Guerry, Inc.
Westinghouse Elec. & Mfg. Co.

REPAIRING—TEXTILE MACHINERY, ETC.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

RESTAURANT EQUIPMENT.
Sanymetal Products Co.

RIBBERS.
(See Knitting Machinery.)

RIB TOP CUTTERS.
General Machine Works.
Wildman Mfg. Co.

RING TRAVELERS—STEEL AND BRONZE.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

RINGS—SPINNING.
(See Spinning Rings.)

ROCKER SHAFT BEARINGS.
(See Bearings.)

ROLLS—CALENDER.
Brooks & Doxey, Ltd.
Butterworth & Sons Co., H. W.
Lord Bros.
Monaghan, Jas. F.
Textile Finishing Mchy. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLS—RUBBER COVERED.
Butterworth & Sons Co., H. W.
Textile Finishing Mchy. Co.
Washburn & Sons, L. R.

ROLLS—STEEL.
Allen Co.
Brooks & Doxey, Ltd.
Butterworth & Sons Co., H. W.
Lord Bros.
Monaghan, Jas. F.
Southern Spindle & Flyer Co.
Textile Finishing Mchy. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLS (WOODEN).
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLL BEARINGS.
Hyatt Roller Bearing Co.

ROLLER CLOTH.
Philadelphia Felt Co.

ROLLER LEATHER.
Bond & Co., Chas.

ROOFING.
Barrett Co.
Cortright Metal Roofing Co.
Southern Wood Preserving Co.
Wardsworth, Howland & Co.

ROOF AND CEMENT COATING.
American Cement Paint Co.
Barrett & Co.
Hockaday Co.
Johnson & Co., Inc., Oliver.
Wardsworth, Howland & Co.
Ware Paint Co.

ROPE—TRANSMISSION.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Link-Belt Company.

ROVING CANS.
(See Cans—Roving.)

ROVING MACHINERY.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

RUBBER STAMPS.
(See Stamps, Stencils, Etc.)

SALTS.
(See Finishing & Sizing Materials.)

SANITARY PRODUCTS.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Sanymetal Products Co.
Taylor, Halsey W.
Vogel Co., Jos. A.
Walker Electric & Plbg. Co.

SASH-WINDOW—STEEL.
Lupton's Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.

SASH OPERATOR.
Drouve Co., G.

SAXOPHONES, ETC.
(See Musical Instruments.)

SCALE PREVENTER—BOILER.
(See Boiler Feed Water Purification.)

SCREENS—MOVING PICTURE.
Southern Theatre Equip. Co.

SCREENS AND SIEVES—PERFORATED.
Allis-Chalmers Mfg. Co.
Erdle Perforating Co.
Knapp Fence Co.
Link-Belt Company.

SCOURING MACHINERY.
(See Washers—Cloth.)

SCRUBBING MACHINE—FLOOR.
American Scrubbing Equip. Co.

SCRUBBING AND WASHING POWDERS.
Mathieson Alkali Works.
India Alkali Works.
Warsa Soap Mfg. Co.

SCUTCHERS.
Brooks & Doxey Co., Ltd.
Lord Bros.
Whitin Machine Works.

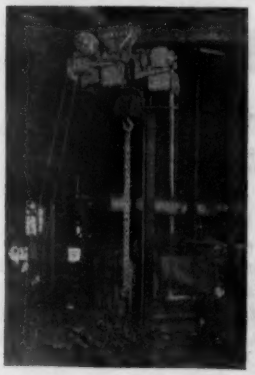
SECOND HAND MACHINERY AND SUPPLIES.
Nashville Industrial Corp.
Toomey, Frank, Inc.

SELVAGE HARNESS.
(See Harness.)

SEWING MACHINES.
Merrow Machine Co., The.
Textile Finishing Mchry. Co.

SHADES—ELECTRIC LAMP.
(See Reflectors.)

SHADES (WINDOW).
Hough Shade Corp.



MORE ECONOMY AND SPEED IN
HANDLING HEAVY MATERIALS

Surprising economies can be effected in a textile mill by the use of hoists. The slight difference in first cost is negligible compared with the saving over the time-wasting, strong-arm, antiquated methods of handling.

A Euclid Electric Hoist does more work than ten men with a chain block, and is more efficient and dependable than any other type of hoists. They are made in styles and sizes for every requirement.

EUCLID CRANE & HOIST CO.
EUCLID, OHIO.

EUCLID
CRANES and HOISTS

WOOLFORD BUILT TANKS

They carry our stamp of identification.

G. WOOLFORD WOOD TANK MANUFACTURING COMPANY
Lincoln Building Philadelphia, Pa.

COTTON MILL REPAIRS

SEND SAMPLES OF PARTS WANTED AND GET OUR PRICES. YOU DON'T HAVE TO BUY.

WE WILL SAVE YOU TIME

AND WON'T EXPECT YOUR ORDER IF WE CAN'T

SAVE YOU SOME MONEY TOO

Briggs-Shaffner Company

WINSTON-SALEM, N. C.

MACHINE WORK FOUNDRY WORK

Shafts, Pulleys, Hangers, Belting Packing, Lacing

BOILERS

For Mills and Public Works. Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies and Repairs for Mills, Hotels, Public Works.

Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store
AUGUSTA, GEORGIA

PUMPS

INDUSTRIAL — AGRICULTURAL — MUNICIPAL — RESIDENTIAL

A type for every service.
Bulletins on request.

The Goulds Manufacturing Company
SENECA FALLS, N. Y.

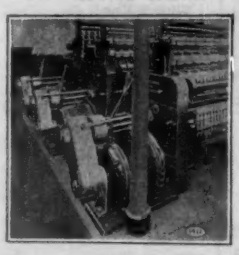
GOULDS

Schofield Patent Automatic Opener and Duster

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY
Iron Founders, Textile Machinery Builders.
Krams Ave., Manayunk, Philadelphia, Pa.

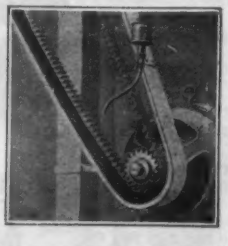


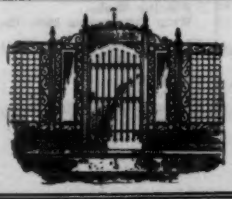
RENOLD CHAINS

For Power Transmission

Montreal HANS RENOLD INC., *Toronto*

365 Broadway, N. Y.





WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St. Baltimore, Md.

SYDNORS SUPREME SERVICE

WELL DRILLING
and DEEP WELL PUMPS

We do the engineering and have been solving water problems satisfactorily for 25 years for textile mills.

SYDNOR PUMP & WELL CO., INC.,
Richmond, Va.

BUYERS' INDEX—Continued.

SHAFTING AND HANGERS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
Wood's Sons Co., T. B.

SHELVING—SECTIONAL STEEL.
Collins, J. D.
Hyatt Roller Bearing Co.
Lupton's Sons Co., David
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

SHINGLES—ASPHALT.
Barrett Co.

SHINGLES—METAL.
Certright Metal Roofing Co.

SHINGLES—WOOD.
Southern Cypress Mfg. Assn.
Southern Wood Preserving Co.

SHIPPING ROOM MACHINERY AND SUPPLIES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Collins, J. D.
Hightower Box & Tank Co.
Royal Metal Mfg. Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.

SHOWER BATHS AND CABINETS.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

SHUTTLES.
Crompton & Knowles Loom
Draper Corporation.
Jordan Mfg. Co.
Shambow Shuttle Co.
U. S. Bobbin & Shuttle Co.
Williams Co., J. H.

SIGNS—ELECTRIC.
Federal Electric Co.

SINGEING MACHINERY.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

SIREN.
Federal Electric Co.

SITES FOR FACTORIES.
(See Industrial Sites.)

SIZE BOX TEMPERATURE CONTROLLER.
Bristol Co.
Foxboro Co.

SIZE KETTLES AND TANKS.
(See Bleaching Kiers or Tanks.)

SIZING AND FINISHING COMPOUNDS.
(See Finishing and Sizing Materials.)

SKEWERS.
Jordan Mfg. Co.

SKYLIGHTS.
Lupton's Sons Co., H. W.

SLAG FOR CONCRETE.
Birmingham Slag Co.

SLASHERS AND SLASHER ROOM SUPPLIES.
Allen Co.
Butterworth & Sons Co., H. W.
Cole Mfg. Co., R. D.
Howard & Bullough
Mossberg Pressed Steel Corp.
Monaghan, Jas. F.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

SLASHER CLOTH.
Philadelphia Felt Co.

SLASHER HOODS.
Cole Mfg. Co., R. D.

SLASHER TAPE.
(See Tape—Slasher.)

SLATE ASPHALT ROOFING.
Barrett Co.

SLIDING PARTITION HARDWARE.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

SLUBBERS.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

SMOKE STACKS.
Casey-Hedges Co.
Walsh & Weidner Boiler Co.

SOAP—TEXTLE.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
India Alkali Works.
Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Mates-Brown Co., Inc., B. P
Rohm & Hass Co.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

SODA—TEXTILE, SODA ASH AND BOILING.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Sonneborn Sons, Inc., L.

SOFTENERS—COTTON.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chem. Co.
Ciba Co., Inc.
Ford Co., J. B.
Grasselli Chemical Co.
Kali Mfg. Co.
Lennig & Co., Chas.
Mates-Brown Co., Inc., B. P.
Roessler & Hasslacher Chemical Co.
Rohm & Hass Co.
Stein, Hall & Co.
United Chemical Prod. Corp.
Wolf & Co., Jacques.

SOFTENERS—WATER.
(See Water Softeners.)

SOLDERLESS CONNECTORS—FRANKEL.
Westinghouse Elec. & Mfg. Co.

SOLOZONE.
Roessler & Hasslacher Chem. Co.

SOLVENTS.
(See Finishing.)

SPEEDERS.
Jordan Mfg. Co.
Parker & Co., Walter L.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

SPEEDOMETERS.
(See Counters.)

SPINDLES.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Vermont Spool & Bobbin Co.
Whitin Machine Works.

SPINNERS.
(See Yarn Manufacturers.)
Myrtle Mills, Inc.
Philadelphia Felt Co.
Parkdale Mills, Inc.
Southern Yarn Co.

SPINNING FRAMES.
American Machine Co., H. & B.
Crompton & Knowles Loom Works.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

SPINNING RINGS.
Brooks & Doxey, Ltd.
Draper Corporation.
Howard & Bullough.
Greist Mfg. Co.
Lord Bros.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

SPINNING TAPE SPECIALISTS.
American Textile Banding Co., Inc.
Barber Mfg. Co.

SPOOLING MACHINERY AND SUPPLIES.
Draper Corporation.
Foster Mch. Co.
Proctor & Schwartz, Inc
Saco-Lowell Shops.
Whitin Machine Works.
Warp Compressing Mch. Co.

SPOOLER TENSIONING DEVICE.
Textile Specialty Co.

SPOOLS AND SKEWERS.
Jordan Mfg. Co.
Lestershire Spool & Mfg. Co.
Mossberg Pressed Steel Corp.
Parker Co., Walter L.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

SPRINKLER SYSTEMS.
American Moistening Co.

SPRINKLER TANKS.
(See Tanks, Towers, Etc.)

SPROCKETS.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.

SPUR CAP SHELLS.
Gallaudet Aircraft Corporation

STAMPS, STENCILES AND STENCIL MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

STAND PIPES.
(See Tanks.)

STARCH AND GUMS.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co.
Corn Products Refining Co.
Kali Mfg. Co.
Kopper Starch Co.
Mathieson Alkali Works, Inc.
Metz Co., H. A.
Staley Co., A. E.
Stein, Hall & Co.
Warren Soap Co.

STEAM ENGINES.
(See Engines—Steam.)

STEAM HOSE.
(See Hose—Fire.)

STEAM PUMPS.
(See Pumps—Steam.)

STEAM SEPARATORS.
(See Separators.)

STEAM TRAPS.
(See Traps—Steam.)

STEEL SHELVING, DOORS, WINDOW PARTITIONS, ETC.
Collins, J. D.
Lupton & Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.
Truscon Steel Co.

STENCILS AND STENCIL PAPERS.
(See Stamps and Stencils.)

STENCIL BRUSHES.
(See Marking Pots and Brushes.)

STENCIL CUTTING MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

STICKS—PICKER.
(See Picker Sticks.)

STICKERS AND LABELS FOR HOSIERY, BOXES, ETC.
Kirby-Cogeshall Co.

STOOLS.
(See Furniture—Mill.)

STOP WATCHES.
Bristol Co.
Silberberg, Mortimer J.

STOP MOTION.
Crompton & Knowles Loom Works.
Draper Corporation.
Eclipse Textile Devices, Inc.
Whitin Machine Works.
Wildman Mfg. Co.

STOKERS.
Westinghouse Elec. & Mfg. Co.

STORAGE RACKS.
(See Shelving.)

STRAPS (LUG, CHECK, HEEL, TUGGER, PICKER HARNESS, ETC.)
Atlanta Harness & Reed Co.
Bond & Co., Chas.
Hayes Loom Harness & Reed Co.
Jacobs Mfg. Co., E. H.
Garland Mfg. Co.

STRAPPING.
(See Leather Specialties or Check Straps.)

STREET LIGHTING FIXTURES.
Cutter Works, George.

SULPHIDES.
(See Finishing & Sizing Materials.)

SULPHUROUS ACID GENERATOR.
Macomb Machine Co.

SWINGS (PLAYGROUND).
(See Playground Equipment.)

SUPPLIES—GENERAL MILL.
Dodge Sales & Eng. Co.
Jenkins Bros.
Link-Belt Co.
Lunkenheimer Co.
Morse Chain Co.
Nashville Industrial Corp.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

SWITCHES—KNIFE-ELECTRIC.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SWITCHBOARDS—PANEL.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SYSTEMS (BUSINESS.)
Ernst & Ernst.

TABLES—MILL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

TACHOMETER (RECORDING).
Bristol Co.
Root Co.

TALLOW.
(See Finishing Machinery.)

TANKS—OIL, GASOLINE, PAINT, ETC.
Bowser & Co., S. F.

TANKS (ELEVATED.)
Casey-Hedges Co.
Cole Mfg. Co., R. D.
Godfrey Conveyor Co.
Lombard Iron Works.
Walsh & Weidner Boiler Co.
Woolford Wood Tank Co., G.

TANKS (SPRINKLER.)
Cole Mfg. Co., R. D.
Lombard Iron Works.
Woolford Wood Tank Co., G.

TANKS (STEEL STORAGE.)
Cole Mfg. Co., R. D.
Godfrey Conveyor Co.
Lombard Iron Works.
Walsh & Weidner Boiler Co.

TANKS (WOODEN.)
Cocker Mch. & Foundry Co.
Hightower Box & Tank Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz.
Textile Finishing Mchry. Co.
Woolford Wood Tank Co., G.

TAPE LOOMS—COTTON.
Foster Mch. Co.
Fletcher Works.
Schaum & Uhlinger.

TAPES AND BRAIDS.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

TAPES—SPINNING AND TWISTING.
Barber Mfg. Co.

TAPE MAKING MACHINES.
(See Bandage and Tape Machinery.)

TAPIOCA FLOUR.
Stein, Hall & Co.

TAX SERVICE.
Ernst & Ernst.

TELEPHONE—CALLING SYSTEM.
Carter Electric Co.
General Electric Co.

TEMPERATURE REGULATORS.
Bristol Co.
Carrier Eng. Corp.
Foxboro Co., Inc.
General Electric Co.
Mates-Brown Co., B. P.
Parks-Cramer Co.
Taylor Instrument Co.

TEMPLES.
Draper Corporation.

TENTERS.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

TENTER HOUSING & RECONSTRUCTING SYSTEM.
Proctor & Schwartz, Inc.

TENTER FRAME DRYERS.
Sturtevant Co., B. F.

TESTERS FOR YARN, FABRIC CORD, ROPE, RUBBER, WIRE, ETC.
Scott & Co., Henry L.

TEXTILE CONSULTING ENGINEERS.
Monaghan, Jas. F.

TEXTILE MACHINERY.
(See Cotton Mill Machinery.)

THEATRE EQUIPMENT.
Southern Theatre Equip. Co.

THERMOMETERS—ANGLE AND STRAIGHT STEM.
Bristol Co.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

THERMOMETERS—RECORDING AND INDEX.
Bristol Co.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

THERMOSTATS.
Bristol Co.
Foxboro Co.

THIN PLACE PREVENTERS.
Draper Corporation.

THREAD EXTRACTORS.
Brooks & Doxey, Ltd.
Lord Bros.

THREAD GUIDES.
Mitchell-Bissell Co.
Palmer Co., The I. E.

TICKETS (RIDER).
Kirby-Cogeshall Co.

TILE & BRICK.
National Paving Brick Co.

TIMBER.
(See Lumber.)

TIME CLOCKS.
(See Clocks.)

TIME RECORDERS.
Bristol Co

TIERING MACHINES.
Collins, J. D.

TIES—BALING.
(See Bale Ties.)

TIRE FABRIC EQUIPMENT.
Fletcher Works.
Warp Compressing Mch. Co.

TOE STICKERS (HOSIERY).
Kirby-Cogeshall Co.

TOILETS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

ALL ABOARD

Winter Excursion Fares And All Year Tourist Fares

—TO—

Alabama	Georgia	North Carolina
Arizona	Havana	Oregon
Arkansas	Kentucky	South Carolina
British Columbia	Louisiana	Tennessee
California	Mississippi	Texas
Florida	New Mexico	Virginia
Washington		West Virginia

—VIA—

Georgia Railroad

Atlanta & West Point R. R.

Western Railway of Alabama

Liberal time limit and stop-over privileges.
For further information apply to

J. P. BILLUPS, G. P. A.

714 HEALEY BUILDING, ATLANTA, GA.

"Cotton Mill Machinery Calculations"

EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on the subject obtainable.

The two volumes are illustrated with 45 diagrams and contain 21 reference tables.

As the value of a book lies in its contents and not in a fancy cover, we have put these two volumes out in a strong, serviceable binding. You can secure them in conjunction with a subscription to COTTON.

Write for circulars and full information.

The Name "Barber" Assures Your Satisfaction
It's hard to talk quality in spinning tape—it's a product that is almost a staple—many manufacturers believing there is no difference between one make and another and no amount of argument will change their opinion.
But regardless of the fact that "Barber" tapes contain just the proper weight and construction to insure long life and smooth, steady operation, there is a certain satisfaction in buying from Barber that is shown in the healthy growth of our business year after year. We believe it's due to the "knowing how" that we put into our product—a knowledge that is the experience of years dating back to the first tape drive put on a spinning frame. Then also, remember that we are spinning tape specialists and that "Barber" tapes set the standard.
"Barber" tapes are carried in an extensive stock for all kinds of textile machinery.
A wire to us at our expense will bring you service that all our customers like. Write us for prices.
Barber Mfg. Co.
Spinning Tape Specialists
LOWELL, MASS.
BARBER
SPINNING & TWISTING TAPES

BUYERS' INDEX—Continued.

TOILET PARTITIONS.
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

TOOL CABINETS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.

TOOL STANDS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Royal Metal Mfg. Co.

TOWERS.
(See Tanks—Elevated.)

TRACTORS—ELECTRIC, INDUSTRIAL.
Collins, J. D.

TRANSMISSION—POWER.
(See Power Transmission Machinery.)

TRAPS—RETURN STEAM.
American Blower Co.
Morehead Mfg. Co.

TRIPTODS.
U. S. Bobbin & Shuttle Co.

TROLLEYS & HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Machy. Co.
Euclid Crane & Hoist Co.

TRUCKS—AUTO.
White Co.

TRUCKS, BASKETC, ETC.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
National Vulcanized Fibre Co.
Standard Fibre Co.

TRUCKS—ELECTRIC—INTER.
Collins, J. D.

TRUCKS—HAND AND ELEVATING.
Collins, J. D.

TRUCKS—INTER, ETC.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
National Vulcanized Fibre Co.
Standard Fibre Co.

TUBS.
(See Tanks—Woodm.)

TUBING—METAL.
Youngstown Sheet & Tube Co.

TURBINES—HYDRAULIC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TURBINES—STEAM.
Allis-Chalmers Mfg. Co.
American Blower Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

TURBO UNDERGRATE BLOWERS.
American Blower Co.
Buckeye Blower Co.
Sturtevant Co., B. F.

TWISTING MACHINERY AND SUPPLIES.
Barber Mfg. Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

TYPEWRITERS.
Smith & Bros. Typewriter Co.

URINALS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

UNIONS—BRONZE.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

VACUUM CLEANERS.
Sturtevant Co., B. F.

VACUUM GAUGES.
(See Gauges.)

VACUUM PANS.
Cresson-Morris Co.

VALVES—ANGLE, GLOBE, CROSS, BLOW-OFF, CHECK, GATE, POP-SAFETY, ETC.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

VALVES—NON-RETURN STOP.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

VARNISHES.
Barrett Co.
Hockaday Co.
Johnson & Co., Inc., Oliver.
St. Louis Surfacer & Paint Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

VATS.
(See Tanks—Wooden.)

VENTILATING APPARATUS.
American Blower Co.
Buckeye Blower Co.
Carrier Eng. Corp.
General Electric Co.
Hough Shade Corp.
Parks-Cramer Co.
Philadelphia Drying Mchy. Co.
Sargent's Sons Co., C. G.
Sturtevant Co., B. F.
Tolhurst Machine Co.
Walker Electric & Plbg. Co.

VENTILATING & HEATING CONTRACTORS.
Walker Electric & Plbg. Co.

VENTILATING WINDOW SHADES.
Hough Shade Corp.

VILLAGE ARCHITECTS AND DESIGNERS.
Robert & Co.
Stirine, J. E.
Stuhrman, Edw. A.

VILLAGE HOUSES.
(See Houses—Ready-Built.)

VOLTMETERS AND AMMETERS.
Bristol Co.
Westinghouse Elec. & Mfg. Co.

WAGON AND CAR UNLOADERS.
Curtis Pneumatic Mchy. Co.

WAREHOUSE—PORTABLE.
(See Buildings.)

WAREHOUSE DOOR HARDWARE.
(See Doors and Hardware.)

WAREHOUSE TRUCKS.
(See Trucks.)

WARP COMPRESSING MACHINES.
Warp Compressing Mch. Co.

WARP DRAWING MACHINE.
Barber-Colman Co.
Crompton & Knowles Loom Works.
Warp Compressing Mch. Co.

WATT METERS.
(See Voltmeters.)

WARPERS AND WARPING MACHINERY AND SUPPLIES.
Auto Creel Corp.
Barber-Colman Co.
Brandwood, John.
Brooks & Doxey, Ltd.
Cocker Mch. & Fdry. Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Lord Bros.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Suter, Alfred.
U. S. Bobbin & Shuttle Co.
Warp Compressing Mch. Co.

WASH BASINS.
(See Lavatories.)

WASHERS—CLOTH.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.

WASHING POWDERS—FLOOR.
India Alkali Works.

WASTE BINS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.

WASTE MACHINERY—COTTON.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Logemann Bros.
Proctor & Schwartz, Inc.
Rex. Eng. Corp.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Schofield Co., Wm.
Whitin Machine Co.

WASTE SEPARATORS.
(See Separators.)

WATCHES (TIME & STOP.)
Silberberg Co., Mortimer J.

WATCHMAN CLOCKS.
(See Clocks—Watchman.)

WATER COOLERS—FOUNTAIN.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

WATER SOFTENERS AND PURIFIERS.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

WATER SUPPLY SYSTEMS.
Hughes Specialty Well Drilling Co.
Sydnor Pump & Well Co., Inc.

WATER TOWERS.
(See Tanks—Elevated.)

WATERPROOFING MACHINERY.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

WEAVING.
(See Yarn Manufacturers.)

WELDING APPARATUS—ELECTRIC ARC.
Bird-Potts Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

WELDING APPARATUS AND SUPPLIES—OXY-ACETYLENE.
Bird-Potts Co., Inc.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

WELDING—JOB.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
Standard Gas Products Co.

WELFARE ARCHITECTS.
(See Village Architects.)

WELFARE EQUIPMENT.
American Laundry Mchry. Co.
Cable Piano Co.
Crane Co.
Conn, Ltd., C. G.
Cutler Works, George.
Hill-Standard Co.
Dixie Culvert & Metal Co.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Rundle-Spence Mfg. Co.
Sherman Service, Inc.
Southern Theatre Equip. Co.
Taylor, Halsey W.
Westinghouse Elec. & Mfg. Co.

WELL DRILLING.
Hughes Specialty Well Drilling Co.
Sydnor Pump & Well Co., Inc.

WHEELS—FIBRE.
(See Fibre Products.)

WHEEL PULLER.
General Electric Co.

WHIP HOISTS.
Mason, Volney W.

WHISTLES—STEAM AND AIR.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

WHISTLES—ELECTRIC SIREN.
Federal Electric Co.

WHIZZERS.
Fletcher Works.
Tolhurst Mach. Wks.
Schaum & Uhlinger.

WINDERS.
Brooks & Doxey, Ltd.
Firsching, J. A.
Foster Mch. Co.
Howard & Bullough American Machine Co.
Lord Bros.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Universal Winding Co.

WINDOW FRAMES AND SASH—STEEL.
Knapp Fence Co.
Lupton's Sons Co., David.
Truscon Steel Co.

WINDOW SASH—STEEL.
Knapp Fence Co.
Lupton's Sons Co., David.

WINDOW SHADES.
Hough Shade Corp.

WIRES—DROP.
(See Drop Wires.)

WIRE FENCING, PARTITIONS & MACHINERY GUARDS.
Anchor Post Iron Works.
Knapp Fence Co.

WIRE HEDDLES.
(See Heddles.)

WIRING CONDUITS AND FITTINGS.
(See Electric Machinery and Supplies.)

WIRING—ELECTRICAL.
(See Electrical Contractors.)

WOOD.
(See Lumber.)

WOOD BLOCK FLOORING.
Southern Wood Preserving Co.

WOOD BEAM HEADS.
Allen Co.

WOOD BOXES.
(See Packing Cases.)

WOOD PRESERVER.
American Cement Paint Co.
Barrett Co.
Dixon Crucible Co., Jos.
Johnson & Co., Inc., Oliver.
Ware Paint Co.
Wadsworth, Howland & Co., Inc.

WOOD PULLEYS.
(See Pulleys.)

WOOD ROLLS.
Washburn & Sons, L. R.

WOOD TANKS.
(See Tanks.)

WOOLEN MACHINERY.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Works.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Mchry. Co.
Tolhurst Machine Works.
Whitin Machine Works.

YARN MANUFACTURERS.
Aberfoyle Mfg. Co.
American Yarn & Processing Co.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Boger & Crawford.
Callaway Mills, Inc.
Dixie Mercerizing Co.
Flint Mfg. Co.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.
Philadelphia Felt Co.
Southern Yarn Co.
Tolar & Hart.
Weimar Bros.

YARN DEALERS AND COMMISSION MERCHANTS.
(See Cotton Yarn and Cloth Commission Merchants and Dealers.)

YARN DRYERS.
(See Dryers.)

YARN DYERS.
(See Dyers.)

YARN TESTERS.
Scott & Co., Henry L.

MASON'S Whip Hoists

Wool, Cotton, Hay, Coffee, Hides, etc. Either by Outrigger or Through Hatchways.

TO OWNERS OF MILLS, DOCKS AND WAREHOUSES:

Many Cotton and Woolen Mills and Warehouses have installed our "Patent Whip Hoist" and many others would if they would only ascertain what a big saving in labor cost their use means, which is the one big item in handling raw material of any kind.

Labor cost is based largely on your equipment, some equipment and methods simply forces labor costs that other equipment would cut in two and give better service.

We hope this statement is sufficiently broad that the value of our Whip Hoists will be constructed by you and we will be glad to furnish any information we can.

We know there are many Mills that would find, if they would look into this matter that they would save money. Kindly let us hear from you.

VOLNEY W. MASON & CO.
VOLNEY W. MASON, Owner
1860 PROVIDENCE, R. I., U. S. A. 1923

Elevated Tanks
Boilers, Engines
Castings
Hosiery Dye Machines

R. D. Cole Mfg. Co.
Newnan, Ga.

ELECTRIC WIRING CONTRACTOR

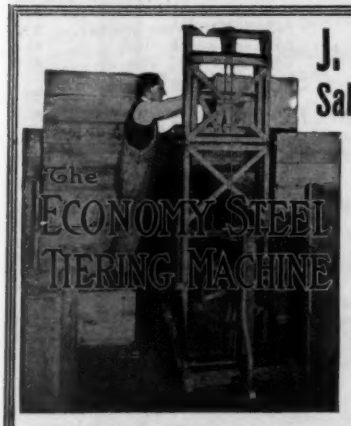
LIGHT POWER

THE CURTIS CO.
Chattanooga, Tenn.
TEXTILE WORK A SPECIALTY

Liquid EBG Chlorine

Our container equipment includes 100 and 150 pound Cylinders, Ton Drums, and Tank Cars.

Electro Bleaching Gas Co.
PIONEER MANUFACTURERS of LIQUID CHLORINE
Plant: NIAGARA FALLS, N.Y.
Main office 19 East 41st Street New York. *Chicago office* 11 So. La Salle St.



J. D. Collins Sales & Eng'g. Co.

STORAGE AND INDOOR TRANSPORTATION EQUIPMENT
55½ Luckie St.
Atlanta, Ga.

Equipment that will reduce your storage and handling expenses. Tiering Machines, Electric and Hand Trucks, Overhead Carriers, Gravity and Power Conveyors of all kinds.

Catalogs and full information furnished upon request

Carrier Engineering Corporation
750 FRELINGHUYSEN AVE., NEWARK, N. J.
Boston Buffalo Philadelphia Chicago New York

AIR CONDITIONING
(Manufactured Weather)

HUMIDIFICATION CLEANING
WINTER HEATING SUMMER COOLING

We will be glad to tell you why and how nearly two hundred of the finest mills in the U. S. are making "Every day a *good* day" with.

CARRIER EQUIPMENT

BUYING A PIG IN A POKE

The buying of advertising space used to be buying "a pig in a poke." The quantity and quality of circulation was shrouded in mystery and often the bag was tied against investigation.

That day has passed. The advertiser no longer depends on "mere claims." The Audit Bureau of Circulation has untied the strings to the sack and the circulation of the better class of publications is thrown open for the most searching scrutiny.

In buying space in COTTON you are not buying "a pig in a poke." Our A. B. C. statements will stand the analysis of the most exacting investigator.

CORTRIGHT METAL SHINGLE

Hand dipping puts zinc *on the edges,* too

This is because the shingle is dipped after it has been cut and formed. Prime roofing tin only is used in Cortright hand-dipped shingles.

CORTRIGHT *Philadelphia* METAL ROOFING CO. *Chicago*

STANDARD SINCE 1887

Advertisers' Index

Aberfoyle Mfg. Co. 426
Alabama Power Co. 19
Aldrich Machine Works ... 268
Allen Company ..... *
Allis-Chalmers Mfg. Co. 267
American Blower Co. 15
American Cement Paint Co.. 269
American Laundry Machinery Co. 421
American Machine Co., H. & B. 373
American Moistening Co. ... 369
American Scrubbing Equipment Sales Co. 259
American Supply Co. 262
American Textile Banding Co., Inc. 265
American Water Softener Co. 289
American Yarn & Processing Co. 278
Anchor Post Iron Works ... 384
Arkray Mills, Inc. 277
Arlington Cotton Mills 277
Arnold, Hoffman & Co. 247
Arrow Mills, Inc. 277
Atlanta Brush Co 258
Atlanta Harness & Reed Mfg. Co. 404
Atlanta Rubber Stamp & Stencil Works 277
Atlanta, Birmingham & Atlantic Railway 276
Atlanta & West Point R. R.. 293
Auto Creel Corp. 256

Barber-Colman Co. ....8, 9 & 283
Barber Mfg. Co. 293
Barrett Co. 371
Beer Co., H. & B. 279
Belger Co. ..... *
Birmingham Slag Co. ..... *
Bird-Potts Co. ..... *
Boger & Crawford 279
Bond & Co., Chas. 396
Borne, Scrymser Co. 249
Bosson & Lane 248
Bowser & Co., S. F., Inc. ... 38
Bradley Mfg. Co., A. J. 428
Brandwood, John 42
Briggs-Schaffner Co. 291
Brinton Co., H. 424
Bristol Co. 271
Brooks & Doxey (1920)) Ltd. 18
Buckeye Blower Co. 375
Butterworth & Sons Co., H. W. 39

Cable Piano Co. 289
Callaway Mills, Inc. 279
Carlyle-Johnson Machine Co.. 273
Carrier Engineering Corp. .. 295
Carter Electric Co. 266
Carver-Beaver Yarn Co. 277
Casey-Hedges Co. 276
Central Dyestuff & Chemical Co. 408
Central of Georgia Railway.. 278
Chisholm-Moore Mfg. Co.... 270
Ciba Co., Inc. 246
Classified Opportunities.282 & 283
Clipper Belt Lacer Co. 272
Cocker Machine & Foundry Co. ..... *
Cole Mfg. Co., R. D. 295
Collins, J. D. 295
Commercial Acetylene Supply Co. 408
Conn, Ltd., C. G. 263
Cooper-Hewitt Electric Co... *
Corn Products Refining Co.. 40
Cortright Metal Roofing Co.. 295
Crane Co. 7
Cresson-Morris Co. 272
Crompton & Knowles Loom Works 253
Curtis, Paul W. 295
Curtis Pneumatic Machinery Co. 275
Cutter Works, George 10

Davis, Roger W. 253
Dixie Portland Cement Co... 268
Dixie Mercerizing Co. 428
Dixon Crucible Co., Jos. 404
Dodge Sales & Eng. Co. ... *
Draper Corporation 3
Dryer Corp. of America 245
Dufur & Co. 291
Durant Mfg. Co. 264

Eclipse Textile Devices 253
Economy Baler Co. 287
Electro Bleaching Gas Co. .. 295
Emmons Loom Harness Co... 289
Ernst & Ernst 382
Euclid Crane & Hoist Co.... 291
Fafnir Bearing Co. 6
Fawcett, Hughes 278
Federal Electric Co. ..... *
Firshing Co., J. A. 404
Fletcher Works 245
Flint Mfg. Co. 277
Florsheim, H. A. 277
Ford Co., J. B. 249
Foster Machine Co. ..... *
Foundation Co., The ..... *
Foxboro Co. 23
Franklin Process Co. 2

Gallaudet Aircraft Corp'n .. 287
Garland Mfg. Co. 393
General Electric Co. ..... *
General Machine Works ... 416
Georgia Railroad 293
Georgia Railway & Power Co. ..... *
Godfrey Conveyor Co. 274
Goulds Mfg. Co. 291
Grasselli Chemical Co. 247
Gray Mfg. Co. 277
Greist Mfg. Co. 262

Hayes Loom Reed & Harness Co. 262
Hemphill Co. 418
Hightower Box & Tank Co... *
Hill-Standard Co. 22
Hockaday Co. 270
Hopedale Mfg. Co. 255
Hotel Cecil 280
Hotel Martinique ..... *
Hotel Sheridan Plaza 280
Hotel Tuller 280
Hough Shade Corp. 408
Howard & Bullough Amer. Mach. Co. 373
Hughes Specialty Well Drilling Co. 285
Hunt Machine Co., Rodney .. *
Hunter Mfg. & Comm. Co... *
Huntington & Guerry, Inc... 269
Hyatt Roller Bearing Co. .....46 and 297

India Alkali Works 248
International Eng'g Works. 12
Ivanhoe-Regent Works of G. E. Co. 263

Jacobs Mfg. Co., E. H. 285
Jacobs & Co. 281
Jenkins Bros. 275
Johnson & Co.., Oliver 32
Jordan Mfg. Co. 404

Kali Mfg. Co. 248
Keever Starch Co. 246
Kirby-Cogeshall Co. 424
Klauder-Weldon Dyeing Mach. Co. 244
Knapp Fence Co. 402

La Frentz & Co., F. W. 285
Lamson Oil Co. 273
Lane & Co., J. H. ..... *
Lennig & Co., Chas. 250
Lestershire Spool & Mfg. Co. 252
Lewis Co., G. B. ..... *
Link-Belt Co. 300
Lockwood, Greene & Co. ... 27
Logemann Bros. 26
Lombard Fdry. & Mach. Wks. 291
Lord Bros. 18
Lowell Crayon Co. 265
Lunkenheimer Co. 13
Lupton's Sons Co., David... 428
Lyon Metallic Mfg. Co. 261

Macomb Machine Co. ..... *
Manufacturing Equip. & Eng'g Co. 265
Manufacturers Machine Co... 398
Mason, Volney W. 295
Masury-Young Co. ..... *
Mates-Brown Co. Inc., B. P. *
Mathieson Alkali Works, Inc. 41
Merrow Machine Co. 416
Metz Co., H. A. 392
Mitchell-Bissell Co. 1
Monaghan, Jas. F. 299
Monroe Calculating Machine Co. 390
Morehead Mfg. Co. 285
Morse Chain Co. 34
Mossberg Pressed Steel Corp. 251
Murray Company, The 16
Myrtle Mills, Inc. 277

Nashville Industrial Corporation 283
National Aniline & Chemical Co. 44
National Paving Brick Co... *
National Shawmut Bank.... *
National Vulcanized Fibre Co. 404
New York & New Jersey Lubricant Co. 274
Norwood Engineering Co. ... 245

Oxweld Acetylene Co. 386

Palmer Co., I. E. 260
Parker Co., Walter L. 256
Parks-Cramer Co. 14
Parkdale Mills, Inc. 277
Pearson, Jos. T. 416
Phila. Drying Machinery Co. 244
Philadelphia Felt Co. 251
Proctor & Schwartz, Inc. ... 4

Re-Fil-It Broom Mfg. Co. ... 261
Reliance Machine Works ... 416
Renold, Inc., Hans 291
Rex Engineering Corp. 259
Rhoads & Sons, J. E. 272
Robert & Co. 28
Roessler & Hasslacher Chemical Co. .....394 and 406
Rohm & Haas Co. 250
Root Co., The 398
Ross-Gould Co. 266
Roy & Son Co., B. S. 260
Royal Metal Mfg. Co. 424
Rundle-Spence Mfg. Co. 264

Saco-Lowell Shops 253
St. Louis Surfacer and Paint Co. 29
Sandoz Chemical Co. 243
Sanymetal Products Co. 400
Sargent's Sons Corp., C. G.. 244
Scaife & Sons, Wm. B. 287
Schaum & Uhlinger 245
Schofield's Sons Co., J. S. .. 276
Schofield Co., Wm. 291
Scott & Co., Henry L. 265
Scott & Williams, Inc. 411
Shambow Shuttle Co. 255
Sherman Service, Inc. ..... *
Showalter Printing Co., A. J. 266
Silberberg Co., Mortimer J. 260
Sirrine Co., J. E. 31
Skayef Ball Bearing Co.... 5
Smith & Bros. Typewriter Co., L. C. 266
Southern Cypress Mfg. Asso. 289
Southern Railway System... *
Southern Spindle & Flyer Co. 264
Southern Theatre Equip. Co. 24
Southern Wood Preserving Co. 402
Southern Yarn Co. 278
Southwestern Broom Mfg Co. 287
Stafford Co. 17
Staley Mfg., Co. A. E. 249
Standard Fibre Co. 285
Standard Gas Products Co... 274
Steel Heddle Mfg. Co. 382
Stein, Hall & Co. 43
Stuhrman, Edw. A. 388
Surpass Chemical Co. 243
Sturtevant Co., B. F. 257
Suter, Alfred 256
Sydnor Pump & Well Co.... 291

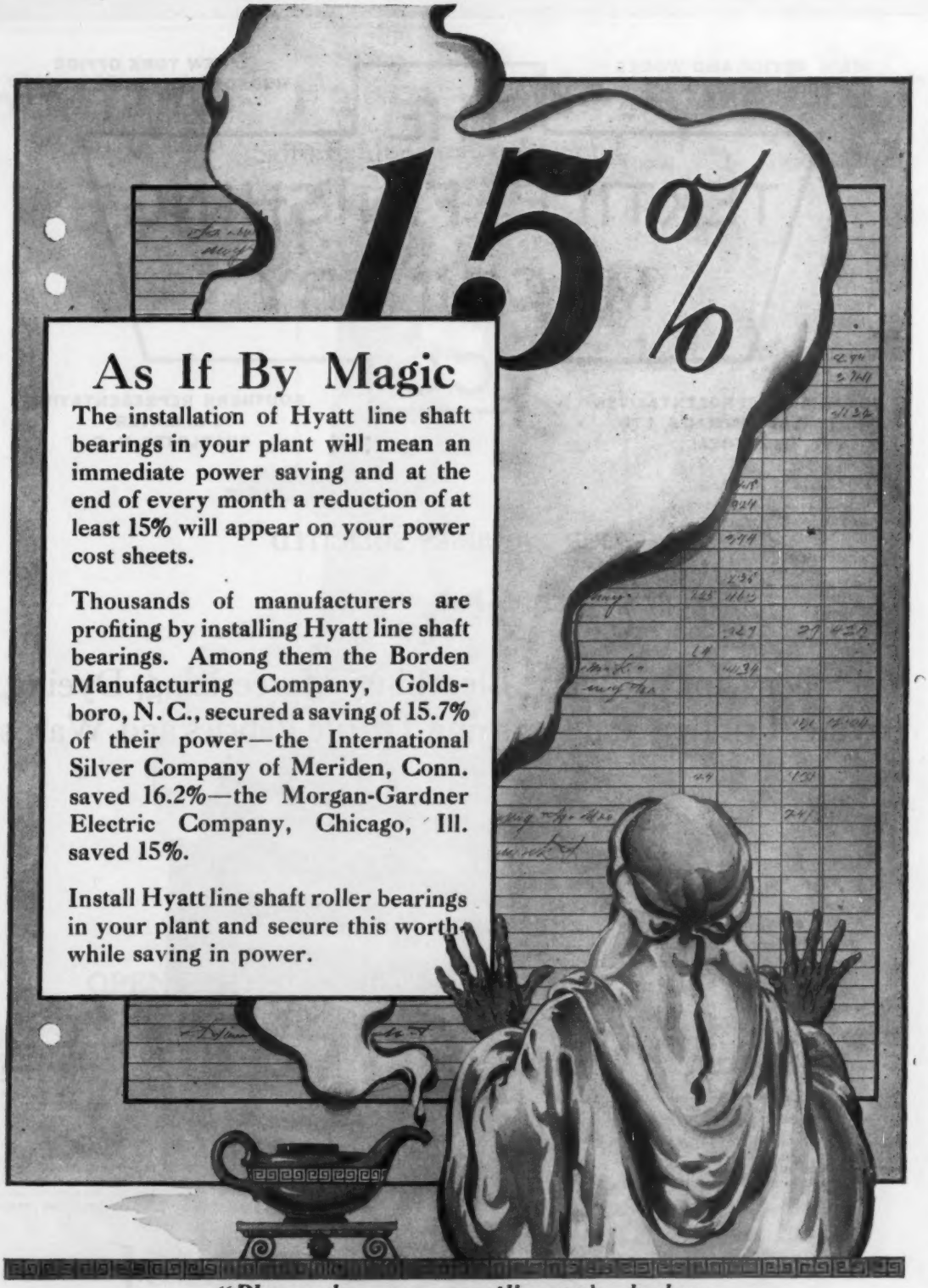
Taylor Co., Halsey W. 25
Taylor Instrument Co. 243
Terrell Machine Co. 400
Texas Co. 37
Textile Finishing Machinery Co. 298
Tennessee Electric Power Co. .....20 and 21
Tolar & Hart 275
Tolhurst Machine Works.... 377
Toomey, Frank, Inc. 252
Torrington Co., The 422
Transmission Ball Bearing Co. 271
Trump Bros. Machine Co.. . 428
Truscon Steel Co. ..... *

United Chemical Products Co. 287
Universal Winding Co. 412
U. S. Ball Bearing Co. 33
U S Bobbin & Shuttle Co... 378

Vermont Spool & Bobbin Co. 254
Vogel Co., Jos. A. 264

Wadsworth, Howland & Co., Inc. ..... *
Walker Electric & Plumbing Co. 267
Walsh & Weidner Boiler Co. 276
Want Ads 282
Ware Paint Co. ..... *
Warp Compressing Machine Co. ..... *
Warren Soap Mfg. Co. 396
Washburn & Son, L. R. 250
Weimar Bros. 277
Westinghouse Electric & Mfg. Co. .....10 and 11
White Co. ..... *
Whitin Machine Works 257
Whitinsville Spinning Ring Co. 252
Wildman Mfg. Co. 414
Williams & Sons, I. B. 35
Williams Co., J. H. 254
Wolf & Co., Jacques 249
Wood's Sons Co., T. B. 36
Woodward, Baldwin & Co... 277
Woolford Wood Tank Mfg. Co., G. 291

Youngstown Sheet & Tube Co. 268



As If By Magic

The installation of Hyatt line shaft bearings in your plant will mean an immediate power saving and at the end of every month a reduction of at least 15% will appear on your power cost sheets.

Thousands of manufacturers are profiting by installing Hyatt line shaft bearings. Among them the Borden Manufacturing Company, Goldsboro, N. C., secured a saving of 15.7% of their power—the International Silver Company of Meriden, Conn. saved 16.2%—the Morgan-Gardner Electric Company, Chicago, Ill. saved 15%.

Install Hyatt line shaft roller bearings in your plant and secure this worthwhile saving in power.

"Phone the nearest mill supply dealer

Hyatt Roller Bearing Company

Newark, N. J.

MAIN OFFICE AND WORKS
PROVIDENCE, R. I.

NEW YORK OFFICE
HUDSON TERMINAL BLDG.

THE TEXTILE-FINISHING MACHINERY CO

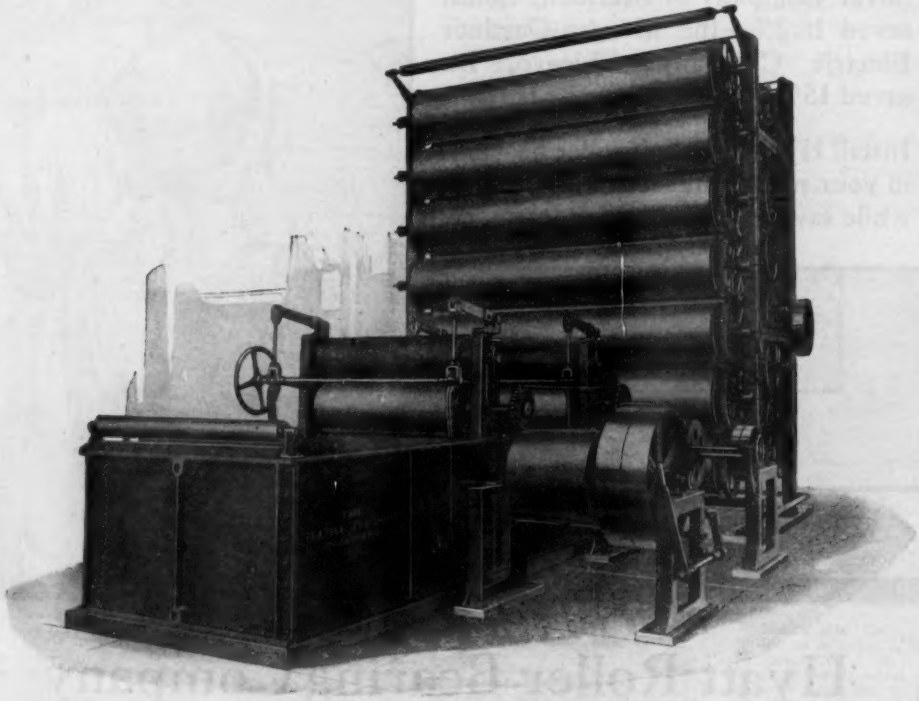
CANADIAN REPRESENTATIVES
WHITEHEAD, EMMANS, LTD.
MONTREAL

SOUTHERN REPRESENTATIVE
H. G. MAYER
CHARLOTTE, N. C.

YOUR INQUIRIES SOLICITED

FOR

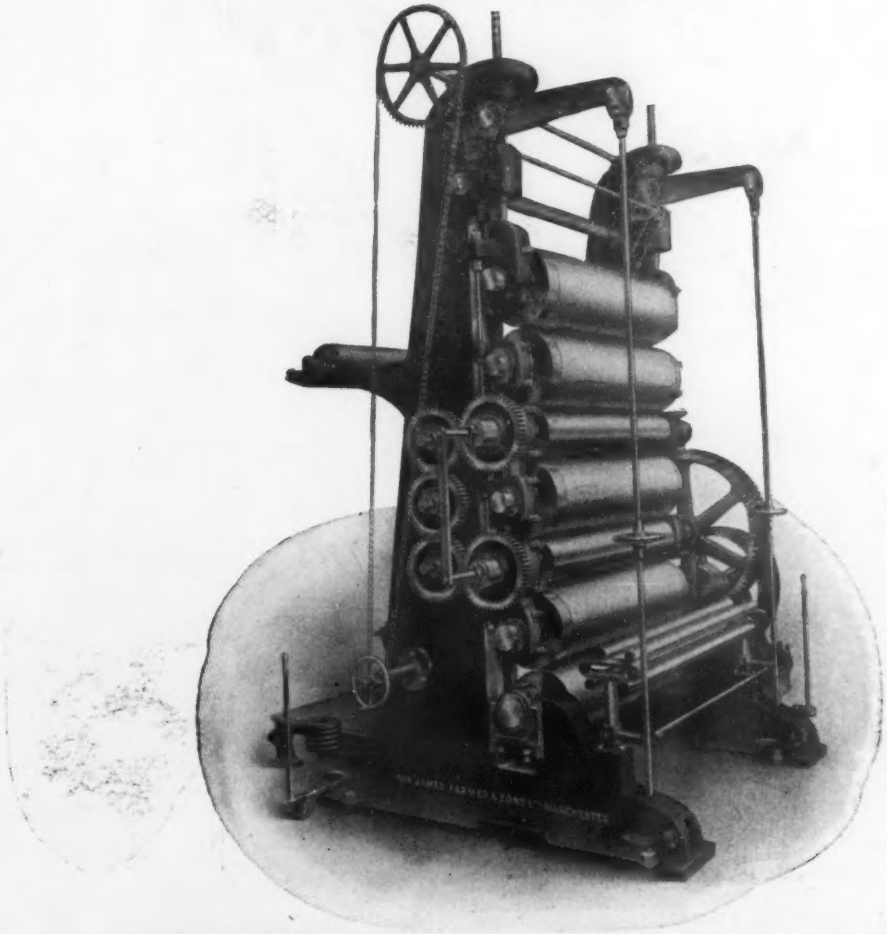
Machinery for Singeing, Bleaching, Mercerizing, Dyeing, Drying, Printing and Finishing Textile Fabrics and Warps



Warp Washer and Dryer

Sir James Farmer Norton, Ltd.

Salford, Manchester, England.



OPEN-SIDED CALENDER WITH SEVEN BOWLS

This open-frame type of Calender has been specially designed for customers who prefer the open-sided Calender because it affords a quicker and more convenient means of changing any individual bowl. The changing of the bowl can be rapidly effected without disturbing the other bowls by removing the loose caps which secure it in the bearings. The frame and bearings are so constructed that the Calender is equal in strength and easy running to one of the closed-frame type.

The Bowls may be arranged to suit the styles of finishes it is desired to produce. The Calender illustrated has a bottom iron bowl, two heated chilled-iron bowls geared together by spur wheels to prevent slipping, and four cotton bowls. The cotton bowls, which are an important factor in the successful working of a Calender, are of our own construction, made and suitably pressed by skilled workmen of long experience, the cotton employed being the best Egyptian cop bottoms, and the bowls being ground to a perfect finish on a special machine of the most modern type.

The Compound Levers are fitted with cam relieving motion at the bottom for taking the pressure off the bowls, and with cam relieving motion at the top for supporting the levers when lifting the bowls, this motion being conveniently worked by chain and chain wheels from below.

The Top Screws are supplied with worm-wheel parallel setting-down gear enclosed in a chamber as a protection from dirt and conveniently actuated by hand from floor level by means of chain and chain wheels as shown on illustration.

The Calender, which is furnished with all the accessories for staving, let-off, batching and chasing, may be driven by electric motor, steam engine, belt or rope with friction clutch, as shown on illustration, with the addition of fast-and-slow-speed gear where required.

James F. Monaghan

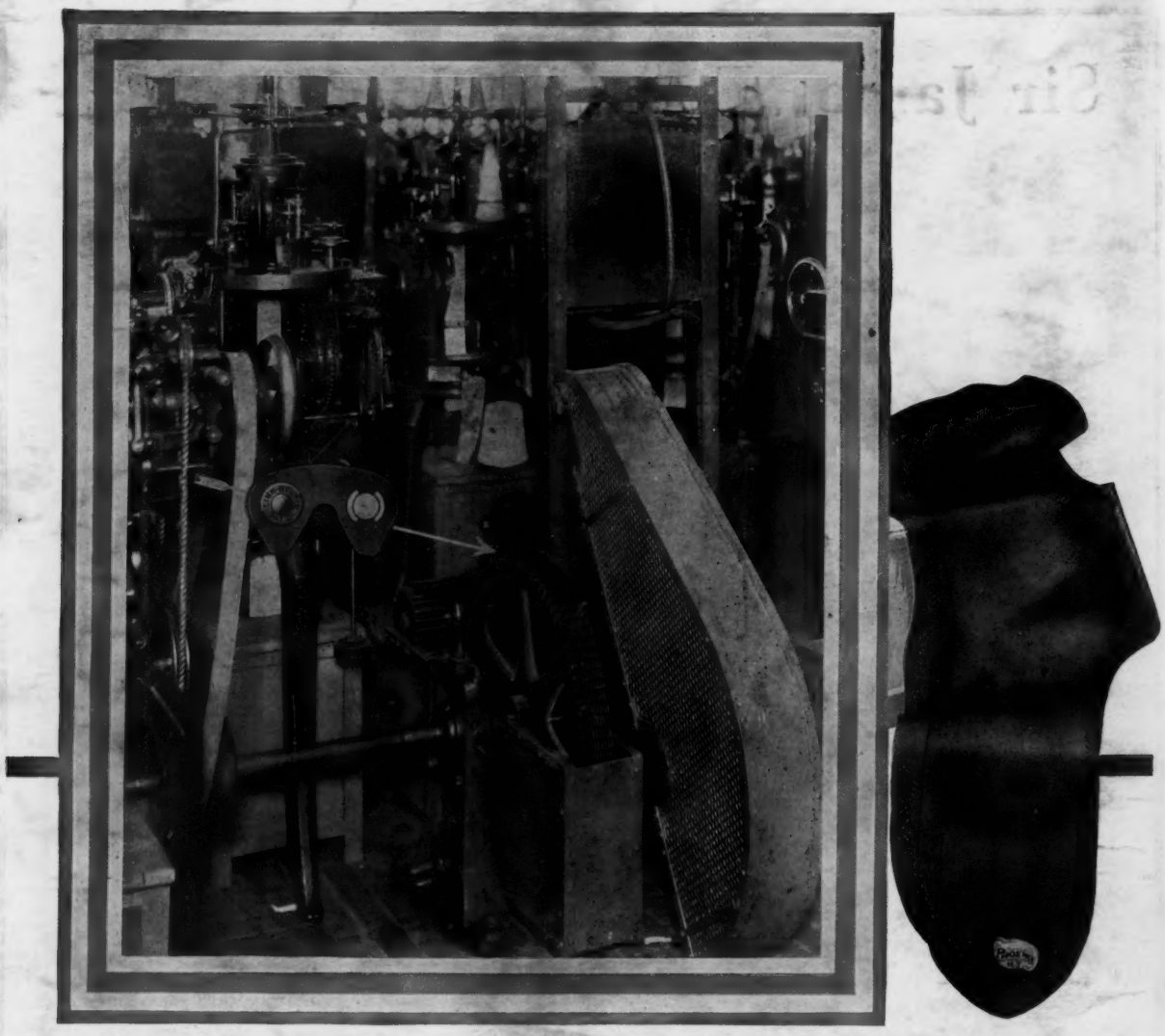
Consulting Engineer

Representative for United States and Canada

52 CHAUNCY STREET **BOSTON, MASS.**

FRED H. WHITE, CHARLOTTE, N. C.

General Southern Representative



—AND AT THE HOME OF PHOENIX HOSIERY

HERE, as in many other plants, Link-Belt Silent Chain Drives serve several purposes. They save power, save time and increase production. And of even greater importance—they improve the product.

The drive is positive; there is no slippage. All the power of the motor is delivered to the machine, smoothly and uniformly. This not only results in greater output and elimination of waste, but makes a better product. Link-Belt Silent Chain is "Flexible as a Belt—Positive as a Gear—More Efficient than Either."

No matter what your product may be, Link-Belt Silent Chain can accomplish similar results in your plant.

1048

PHILADELPHIA CHICAGO LINK-BELT COMPANY TORONTO INDIANAPOLIS

New York - - Woolworth Bldg. Wilkes-Barre - - - 24 Nat'l Bank Bldg. Seattle - - - 239 First Avenue, S. Atlanta, Ga., 610-11 Citizens and Southern Bank Bldg.
Boston 9 - - 49 Federal St. Huntington, W. Va. - Robson-Prichard Bldg. Portland, Ore. - - - 101 First St. Louisville, Ky. - - Frederick Wehle, Starks Bldg.
Pittsburgh - - 1501 Park Bldg. Cleveland - - - 429 Kirby Bldg. San Francisco - - - 168 Second Street New Orleans - - C. O. Hinz, 504 Carondelet Bldg.
St. Louis - Central Nat'l Bank Bldg. Detroit - - - 4210 Woodward Ave. Los Angeles - - 163 N. Los Angeles St. Birmingham, Ala., S. L. Morrow, 720 Brown-Marx Bldg.
Buffalo - - 547 Ellicott Square Kansas City, Mo. - - 306 Elmhurst Bldg Denver Lindroth, Shubart & Co., Boston Bldg. Charlotte, N. C. J. S. Cothran, Com'l Bank Bldg.

Canadian Link-Belt Co., Ltd., Toronto and Montreal H. W. CALDWELL & SON CO., CHICAGO NEW YORK, Woolworth Bldg. DALLAS, TEXAS, 709 Main St.

LINK-BELT
SILENT CHAIN DRIVES